Environmental Analyisis of the Colorado Front Range Vegetative Management Pilot Project

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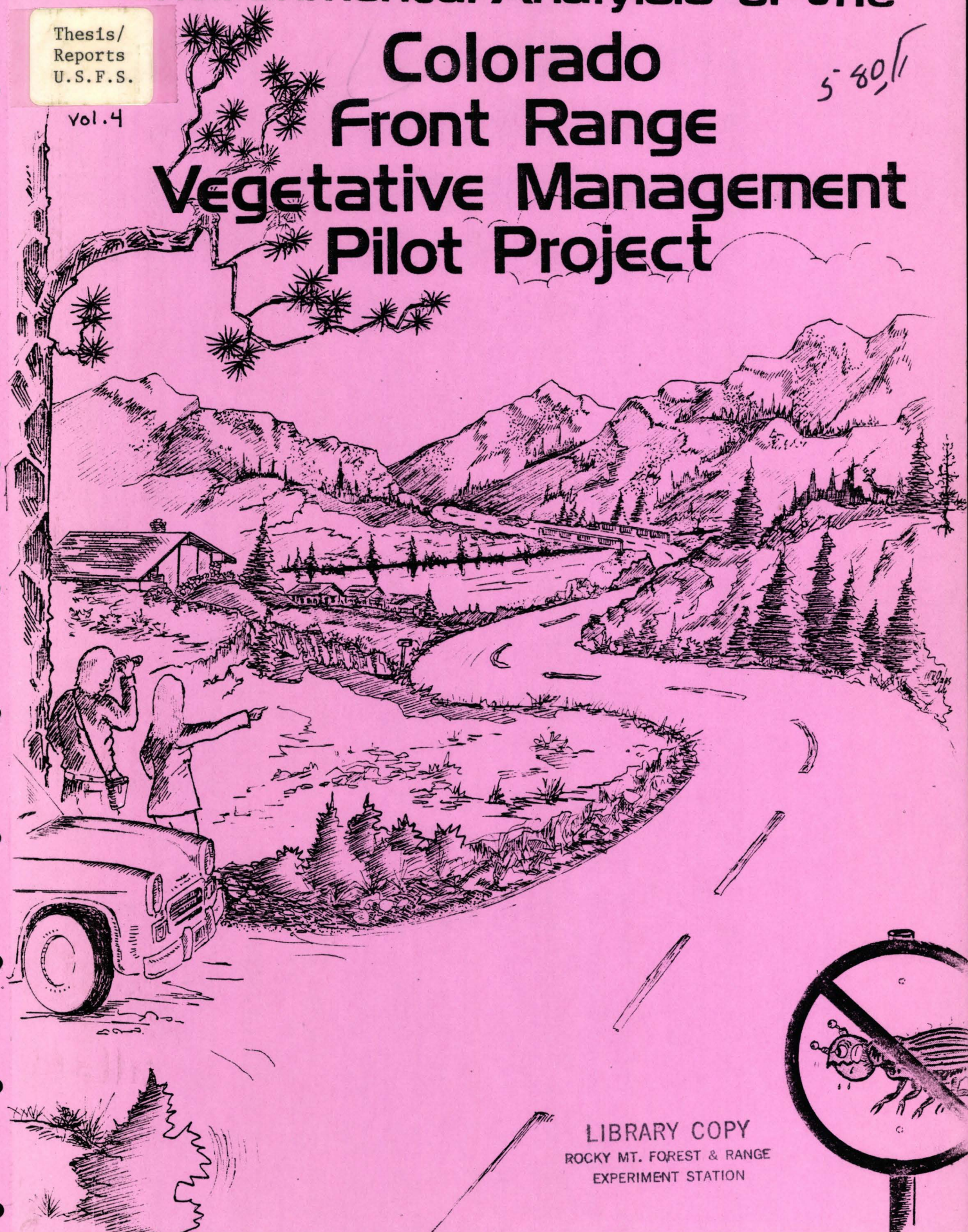

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SUMMARY

The Colorado Front Range is experiencing a devastating mountain pine beetle epidemic. The continued buildup of forest fuels from the dead and dying trees poses an increasing threat of catastrophic wildfire. Key values of recreation, scenery and wildlife are threatened.

A vegetation management budget proposal, Appendix B, which recommended treatment for the beetle epidemic and forest fire fuel buildup, was made which included the whole Front Range. From this proposal, a pilot project area was selected for environmental analysis.

Three management alternatives are evaluated to consider which alternative best meets selection criteria developed by a management team made up of representatives from Boulder County, the Colorado State Forest Service, and the National Forest Service. Alternative 3 was selected. It proposes an approach through forest management which includes direct control for beetles, indirect beetle control through improved tree health and reducing fuel buildup. The cost for the project is $4,341,300.

The probable environmental impacts of the selected alternative will not be a significant environmental impact, controversial and does not qualify for requiring an environmental statement.

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USDA FOREST SERVICE
Environmental Analysis of the Colorado
Front Range
Vegetative Management
Pilot Project

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Environmental Analysis of the Colorado Front Range
Vegetative Management Pilot Project

Recommended By: _____ Date June 29, 1977
District Forester
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Recommended By: Bob Saban Date June 29, 1977
Forest Manager
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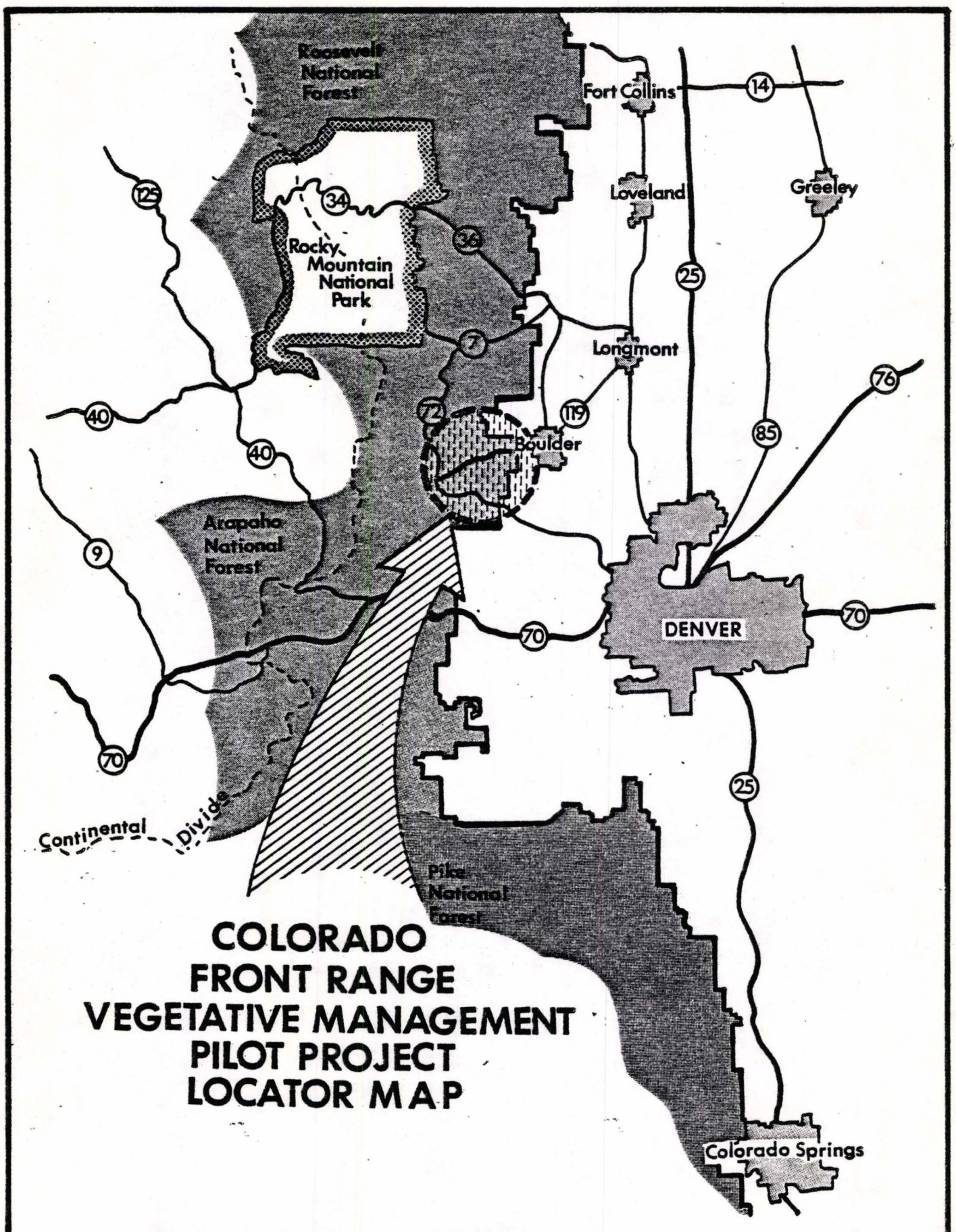
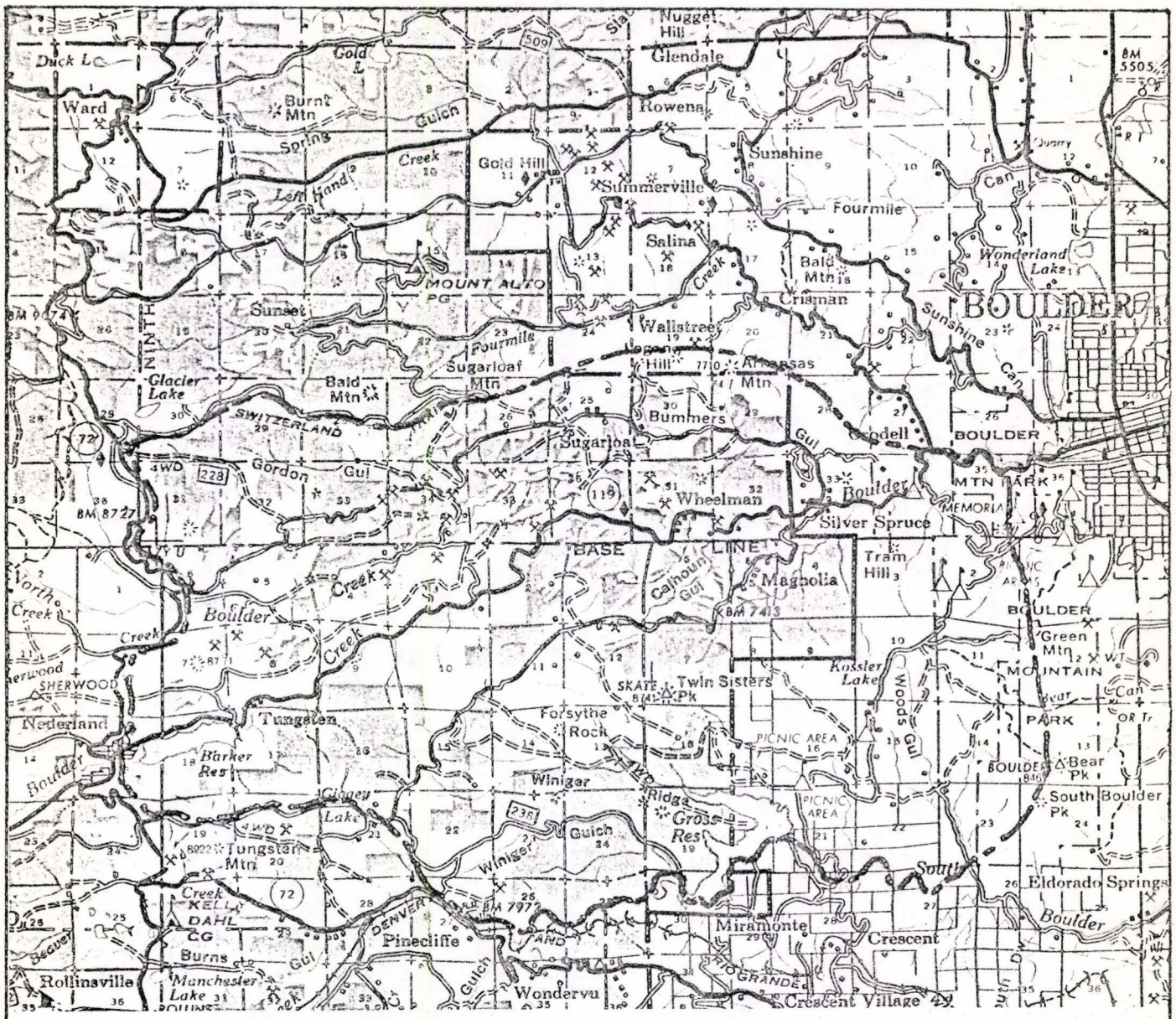


COLORADO FRONT RANGE VEGETATIVE MANAGEMENT PILOT PROJECT LOCATOR MAP



COLORADO FRONT RANGE VEGETATION MANAGEMENT PILOT PROJECT AREA MAP

I. GENERAL RELATIONSHIPS AND DIRECTION

I. General Relationships and Direction

A. Background

Since the early 1900's the Colorado Front Range has had repeated outbreaks of mountain pine beetle epidemics. In the past two decades the beetle activity has increased to a point where, by 1975, an estimated 1.5 million trees were infested throughout the Front Range. The reasons for mountain pine beetle epidemics are not completely understood but man's impact on the forest have contributed to Forest conditions which results in the present epidemic.

The effective fire protection and lack of stand management have allowed forest fire fuels (trees) to increase to a point where there is a high hazard of large wildfires.

Over two million people live near the Front Range, in Denver, Colorado Springs, Boulder, Pueblo and other smaller communities. Consequently, forest recreation is heavy in this area. Also, large numbers of travelers from all parts of the nation also use the Front Range highways.

One third of the Front Range is privately owned and 40 percent of the privately owned land is occupied by residences and commercial establishments.

The interaction of the beetle epidemic, forest fire fuel buildup, heavy recreation use and mixed land ownership with developed private lands has resulted in great concern by the public, the Colorado Congressional delegation and local, County, State and Federal agencies and representatives. These concerns are discussed in the Issues and Concerns Section of this report. A comprehensive assessment, the Colorado Front Range Vegetation Management Budget Proposal (Appendix B) was made which contains a more complete description of the situation.

B. Current Situation

The Front Range, which is considered here as that portion of the Rocky Mountains east of the Continental Divide in the northern half of the state and the eastern slope of the Sangre De Cristo Range in Southern Colorado, has problems which make it desirable that land management agencies and private landowners develop management direction which will solve the problems of a very dangerous fire situation and a dying forest. The Front Range vegetation management budget proposal does that for the Front Range; however the concept needs testing before it is extensively applied. A pilot project is proposed to focus on the specific environmental effects, test treatment techniques and procedures and improve the cooperative program among private landowners, County, State and Federal Agencies.

The pilot project area consists of 34,300 acres lies west of the Boulder Flatirons, north of South Boulder Creek, east of the Peak to Peak Highway (Colorado 72) and south of a line running along the mountain tops from Glacier Lake to Sugarloaf Mountain, and then to Boulder Canyon.

Table 1
Pilot Project Area Ownership

Owner or Management Agency	Approximate Acres	Percent
Private	15,040	44
USDA Forest Service	12,200	36
Boulder County	4,300	13
Denver Water Board	1,200	3
City of Boulder	800	2
USDI Bureau of Land Management	600	2
City of Nederland	160	less than 1
	34,300	100

The pilot project area was selected because:

- It is typical of the intermixed land ownership in the ponderosa pine forest type on the Front Range with sixteen subdivisions in the area.

- There is high recreation use in the area.

- There are four designated control areas for mountain pine beetle control in the area, where control is conducted by the Colorado State Forest Service and private landowners.

- Several landowners associations, the Cities of Denver and Boulder have demonstrated interest in forest management practices as a means of controlling beetles and reducing the threat of catastrophic fire.

- Some land use information has been compiled for the area by the Boulder County Planning Department.

- Fuel densities and fire hazard have built up to a critical degree, requiring management to avoid a catastrophic fire.

- A Forest Management Plan has been completed on 6,000 acres of the area by the Colorado State Forest Service.

- There is good cooperation between the private landowners, Boulder County, Colorado State Forest Service and the Forest Service (USDA).

This report analyzes the Front Range Vegetative Management proposal as applied to a pilot area as well as two other logical courses of action. These alternatives are:

1. No Action.

2. Current Management.

3. Vegetative Management.

A description of these alternatives is in Chapter VI, page 19.

C. Relationships Among the Private Landowners, Boulder County, State and Federal Agencies

The complex landownership pattern is typical of much of the Front Range where seven different types of ownerships (Ref. Table 1) requires the close cooperation between the agencies and organizations which are working in the area.

Boulder County has a Forest Manager, whose primary job is to establish and administer Forest management programs for the mountainous areas of Boulder County. This position is an important contact between private landowners and local organizations in the county and State and Federal Agencies. The Boulder County Forest Manager is the first position of this sort filled in Colorado.

The Colorado State Forest Service has responsibilities to establish and carry out forest management programs on State and private lands. This agency also has an important job of fire management which includes fuel abatement, prevention, training local fire departments and fire suppression on state and privately-owned lands.

The Forest Service (USDA) has the responsibility of administering National Forest System lands to achieve management goals which will enhance the key values of recreation, esthetics and wildlife. Another primary responsibility is cooperative management with State and county agencies as part of the State and Private Forestry Division. The third division of the Forest Service, Research, represented by the Rocky Mountain Station in Fort Collins, also has a job of providing technical knowledge and monitoring the proposed management program.

The Bureau of Land Management, USDI (BLM) has submitted a vegetative management proposal to their Washington Office. This proposal includes the 600 acres of BLM land with the Pilot Project Area. The proposal is currently pending approval. Presently, the BLM is carrying out a limited vegetative management program on their lands.

The differences in funding, regulations, policy and goals are many. A coordinated and unified program with common goals and objectives is essential in coping with the insect epidemic and fire hazard in this area. There is a need for a management team, with representatives from each agency, to organize and manage the project area if action programs are adopted.

D. Assumptions about the Future

The demand for recreation opportunities will continue to increase as local population and residential development increase.

A continuing need for energy conservation will result in a need to provide a variety of outdoor recreation opportunities close to metropolitan areas.

Maintenance of scenic quality will become more important.

The mountain pine beetle epidemic will spread to almost all stands of ponderosa pine on the pilot project area regardless of direct control unless the forest is managed to provide healthy and vigorous trees which are insect resistant.

Commercial timber sales will not be an adequate insect control method since markets for products will not develop in time to provide effective control.

Recreation values related to wildlife opportunities will increase as recreation use and subdivision development increases.

Residential development will increase on private lands in the project area. The number of subdivisions will remain at the present level due to County land use regulations.

The probability of large wildfires will increase as heavy dead fuels build up on the project area.

Public request for pine beetle control and general forest management assistance will increase as more trees die.

The demand for firewood will continue to increase as the price of heating fuels increases.

The demand for high quality water in increased quantities will increase.

The potential for fire occurrence will increase as development and recreation use increases.

E. Issues and Concerns

Issue - Should direct control by insecticides and burning be used along with vegetative management to control the beetle epidemic or should vegetative management alone be used? Concerns expressed by the public are as follows 1/:

Some people feel that insecticides will persist in the environment and insecticides will damage wildlife and plants and cause health problems. Others feel that direct control with insecticides is necessary to reduce the beetle epidemic to acceptable levels.

Some people feel vegetative management alone can control the beetle epidemic in the long run. Some are concerned that burning may cause air pollution.

Issue - Should live fuels be reduced or can fire prevention and protection effectively keep property and resource damage at low levels? Concerns expressed by the public are as follows 1/:

Some people feel that slash from reduction of live fuels will lower scenic and property values, and that burning slash to reduce fuels will cause air pollution. Some feel fire will "get away" from controlled burning of slash and cause wildfires.

Others feel that high recreation and residential use in the area will result in wildfire starts regardless of fire prevention efforts and that fire fuel buildup will result in large wildfires regardless of fire protection levels.

Issue - How will the management of the pilot project effect the social and economic patterns of Boulder County and surrounding areas? Concerns expressed by the public are: 1/ 2/

Some people feel that sale of salvage wood products at low prices will drive down the price of wood products offered by local landowners and businessmen. Other people will use the free fuelwood to offset higher energy prices.

The project will reduce unemployment in the area, but this will be a short term change which some people judge worthwhile and others feel has little value.

1/ Issues and concerns from the County, State, and Federal management teams perception of public views based on correspondence, telephone calls and discussions with the public.

2/ Paraphrased from the Boulder-Grand Divide Land Management Plan Environmental Statement.

F. Management Goals

1. Manage forest fire fuels to reduce wildfire to a level which will minimize annual losses and reduce suppression costs.

2. Provide healthy and vigorous trees, through silvicultural treatment, which are insect and disease resistant. Favor genetically superior, visually attractive and key wildlife trees.

3. Maintain or improve fish and wildlife habitat through forest management.

4. Improve, maintain or restore the scenic quality of the forested areas.

5. Provide a wide range of outdoor recreation opportunities on public lands.

6. Reduce mountain pine beetle populations to an endemic level.

7. Continue effective cooperation between County, State and Federal agencies and private landowners.

8. Demonstrate mountain pine beetle control and vegetative management methods which are economically feasible and socially acceptable.

G. Selection Criteria

The selected action will be based on an evaluation of the alternative which:

- Best satisfies the management goals.

- Best maximizes the output of goods and services.

- Best maximizes favorable effects and minimizes adverse effects.

- Results in economic efficiency of the investment.

- Results in the greatest social benefits.

- Best maintains or enhances long term productivity.

- Provides the fewest irreversible and irretrievable resource commitments.

II. ENVIRONMENTAL SETTING

II. Environmental Setting

A. Physical Setting

Geology and Minerals

The general geology of the project area is that of Precambrian granites and mica schists that were uplifted, fractured and eroded into the present landforms. The major uplift, known as the Laramide Orogeny, occurred at the end of the Cretaceous period forming the Rocky Mountains. Two northwesterly trending major fault traces in the area are the Rogers and Hurrican Hill Dikes also referred to as "breccia reefs" because of the highly siliceous rock that is more resistant to erosion than the surrounding rock. The Rogers Dike trends from Gross Reservoir to North Boulder Creek where its trace is lost; the Hurricane Hill dike appears from east of Barker Reservoir to beyond Hurricane Hill to the northwest.

While neither dike is mineralized, both are believed to have provided pathways for mineralizing solutions that invaded the area during Tertiary time. Valuable minerals found within the project area consist of gold, silver, lead, zinc and tungsten deposits.

Soils

Two major rock types provide the parent material for most of the soils; the Boulder Creek Granodiorite and the Silver Plume Monzonite. These parent rocks produce a wide range of soil textures from loamy sand to silt loam with coarser textured soils developed from the Monzonite.

Most soils are well to excessively drained. Those on the alluvial bottoms frequently have drainage problems. The low productivity and the available moisture frequently limits plant growth.

Many of these soils have a high erosion potential where the ground cover has been removed or significantly disturbed. Revegetation of disturbed areas requires rather exacting procedures due to low fertility and available moisture. Soil slumping and slipping has occurred in the past. The potential still exists, but this occurs on less than 5% of the area and is generally not a significant management problem. The productive potential for growing vegetation ranges from very low to moderate.

Climate

The Continental Divide causes Pacific weather fronts to drop most of their moisture at high elevations west of the project area. Consequently, the project area is in a rain shadow. Weather systems from the Gulf of Mexico may cause intense summer thunderstorms.

Average annual precipitation increases about two inches for every 1,000 feet increase in elevation. Average annual precipitation ranges from about 18 inches in the lower elevations to about 25 inches at higher elevations to the west. May is the month of highest precipitation. About 40 percent of the annual precipitation is snow. The snow pack melts by May 15th. 1/

Mean average temperatures in January range from 19° F to 40° F. During July the range is 55° F. to 82°. The growing season averages 100 days at higher elevations to about 130 days at lower elevations. 2/

The area is swept with high winds much of the time. Data from the nearby Sugarloaf weather station shows winds in excess of 75 miles per hour will occur 37 days per year while winds between 1 and 35 miles per hour occur approximately 178 days per year.

North, South, and Middle Boulder Creeks are used for collection and conveyance of water to metropolitan Denver and Boulder and the agricultural areas on the plains. Barker and Gross Reservoirs are components of the water transmission system.

There is little opportunity to increase water yield in the lower elevations. At higher elevation runoff could be increased 5-10 percent, if treated specifically for water yield.

Ground water is in danger of being polluted by septic systems where mountain communities are expanding. Stream pollution originates mainly from mine tailings, chemical and solid wastes, sewage and soil disturbance.

Scenery

The characteristic landscape in the project area is generally broad, rolling and tree covered. There are no dominant topographic landforms but there are several high peaks (Bald Mountain, Sugarloaf, Peewick Mountain, Twin Sisters) that are prominant in the area but because of their heighth, rounded tops and gradual slopes, they are not dominant or spectacular.

The area is dissected with deep, narrow canyons. The combination of rocks, trees and shrubs, and water found in these canyons adds variety to the scenery. The ridges between drainages are gentle sloping with rounded ridge tops.

1/ Snow Frequency Analysis for Colorado and New Mexico Snow Course, 1974 by Soil Conservation Service.

2/ A Climatological Transect on the East Slope of the Front Range, Colorado By R.G. Barry, Arctic and Alpine Research, Volume 5, Number 2, 1973.

B. Biological Setting

Vegetation

The coniferous forests of this area are made up of three major types:

Ponderosa Pine -- These are usually even-aged stands representing all age classes within the area. These stands vary from open park-like stands to patches of dense trees. The more open stands have a light to moderate herbaceous plant density under the forest canopy.

Douglas-Fir -- These are all-aged, multi-level and moderately dense stands of Douglas-fir, which are usually dominate on north and east aspects. On drier sites and other aspects Douglas-fir is mixed with ponderosa pine at lower elevations and lodgepole pine at higher elevations.

Lodgepole Pine -- These stands usually occur in dense even-aged stands. The closed canopy causes a forest floor with little herbaceous vegetation.

Biological characteristics of the forest are highly variable. Most obvious are variations in stand density, age class distribution, tree vigor, presence of disease and insects, and size of the stands with uniform density and age structure that make up the forest mosaic. Present conditions are the result of past logging, insect and disease attacks, fires, and other factors related to regeneration.

The objective of silviculture, in this area, is not to obtain maximum production of wood products. Instead it is a means of improving the quality and diversity of the landscape and of providing as high a potential for a variety of uses as is compatible with carrying capacity of the land.

Timber volume for ponderosa pine developed on private lands in Boulder County averages 2460 merchantable board feet per acre (704 cubic feet). Average diameter breast high is 8.6 inches. These figures apply to public lands as well.

Due to the relatively small tree size and low timber volumes per acres, commercial timber harvesting is marginal from the economic standpoint. This has contributed to the lack of timber harvesting in the project area.

Basal area for ponderosa pine averages 65 actual square feet per acre or a growing stock level of 72 square feet per acre. Fifty six percent of the stands average above 60 square feet of basal area and 32 percent exceed 80 square feet. These are area averages; clumps within stands may exceed 150 square feet.

The area is characterized by a variety of plant communities besides the forests. Open grassland parks, with the most common vegetation being Arizona fescue, mountain muhly, blue grama, Parry oatgrass, sedges, and a variety of forbs, are interspersed amoung forested areas. The herbaceous species under the tree canopy include many of the same species that comprise the open grassland parks. Dense stands of conifers have little more than a mat of needles on the ground. Along the streams, blue spruce and cottonwood are the prominant tree species with interspersed meadows covered with sedges, rushes, tufted hairgrass, wheat grasses, and willows. The Federal Register (6-16-76 pp 24525-24570) does not list any endangered plants which are in the vicinity of the project area and no endangered or threatened plant species are known to occur in the project area.

Wildlife

Wildlife species found in the area include deer, elk, black bear, coyotes, rabbits, squirrels, turkey, woodpeckers, robins, juncos and a variety of other birds and mammals. The streams and reservoirs have several species of trout. No endangered or threatened wildlife are known to use the area. The project area was historical habitat for two endangered species, the Greenback Cutthroat Trout and Peregrine Falcon. At this time the habitat is still capable of supporting these two species but only marginally suitable for reintroduction because of habitat modifications through development and a high level of competition with current uses.

Home development and a high density road system is a significant impact on deer and elk. Disturbance in terms of duration and intensity is high. As human use increases, environmental quality and available wildlife habitat decrease. The mountain pine beetle epidemic is reducing the amount of food and cover for many species associated with the ponderosa pine forest. The change is not detrimental to all species, however. Birds and animals adapted to open forests and grasslands can expand their ranges into the habitat modified by the beetles.

The area has about 28 miles of perennial streams and four reservoirs which support fish. The Colorado Division of Wildlife stocks trout in these waters which supplements natural production thus helping satisfy the high fishing demand. Approximately 75 percent of the fishing is at reservoirs.

Fire

The fire situation in the project area is undergoing two significant changes. The first change is an increase in fire starts and the second is a marked increase in fuel loading. The net result is a potential increase in fire damage and fire suppression costs.

The increase in fire starts is a result of two unrelated factors. One significant factor is the increase in man-caused fires, due to the high usage of the area. The second factor affecting fires starts is the change in microclimate resulting from the mountain pine beetle (MPB) epidemic. As the pine canopy is removed by MPB attack, the average fuel temperature increases and the average fuel moisture decreases. The result is an increased probability of ignition.

Statistics on the Boulder-Estes Park Ranger District for 1960 through 1969 show an average of 15.6 fires per year. Conversely, data for the period of 1971 through 1975 indicates an average of 21 fires/year, illustrating this increased risk. Based on this information, it is assumed that the number of fire starts will increase over the next several years.

Fuel loading is probably the most significant fire problem in the area. The MPB epidemic is rapidly converting open ponderosa pine stands to standing dead timber with a heavy litter understory. As a result, fires in the beetle infested areas generally demonstrate extreme fire behavior with an explosive crown fire potential. Energy release in these heavy fuel loadings can be several times higher than fires in green ponderosa stands.

The combination of increased fire starts and heavy fuel loading together with the large number of residences in the area create a dangerous and potentially lethal fire problem. One example of this situation was the Comforter Mountain fire in 1976 which occured near the center of the project area.

The fire started from an unattended campfire and consumed 257 acres before a windshift made it possible to contain. The Comforter fire occured in one of the few areas west of Boulder that is not inhabited by people. The greatest problem of the fire itself was a combination of wind and large groups of beetle infested and beetle killed trees.

If the present MPB epidemic continues unchecked, it is quite possible that one or more disasterous fires could occur as a result of these fuel build-ups, fires that threaten individual lives and public and private property.

C. Social and Economic Setting

Land Ownership

Landownership patterns are complex. Between 1878-1910, most of the mining claims were patented, with the rest of the private lands obtained through homesteading. Subsequently, the private lands have been subdivided for residential development with a current total population of approximately four to

five thousand. Land suitable for a residential building site ranges between $4,500 to $17,000 per acre. Often land sales are not properly surveyed. The result is conflicting surveys and inadequate property line identification. Properties developed prior to the subdivision process and isolated mineral patents have no provision for public roads and rights-of-way thus creating a hodgepoge of roads serving only individual needs.

Land Uses

Private lands are primarily used for residential development while the National Forest lands provides wildlife habitat, recreation opportunities, and scenery. A substantial number of unpatented mining claims are occupied by dwellings that have been in place since the mining days. Special uses on National Forest lands consist of road rights-of-way, electric and phone lines and water developments that primarily serve residential use.

Access to the private lands in most cases is partially across National Forest lands. Access to public lands across private lands is generally not available.

More development is expected on nearby mountain property because of the growth limitation policy within the City of Boulder.

Cultural

The area lies within the seasonal hunting territory of the Cheyenne and Arapaho Indians. The site files of the Office of the State Archaeologist of Colorado have been searched and four aboriginal sites have been recorded within the boundaries of the pilot project. These sites indicate use of the area by Utes or Shoshones, though ethnographically, this was the territory of the Cheyenne and, perhaps, the Arapaho.

As early as 1810 trapping camps were established on Boulder Creek. Following the discovery of gold in 1859 there was a rush to the hills west of Boulder and the area was extensively prospected for minerals.

There have been a number of booms and busts since gold was first discovered. Transportation of ore to market was a problem. With this in mind, the Colorado and Northwestern Railroad and its successor, the Denver, Boulder, and Western Railroad extended rail service from Boulder to Ward and Eldora. The road was abandoned in 1918 following a cloudburst and flood which washed out sections of track in Fourmile Canyon. The Moffat Railroad across Rollins Pass was completed by 1904 and operated until 1929 when the Moffat Tunnel was opened.

In the 1870's many tracts in the region west of Boulder were homesteaded and patented by a group of French settlers, chiefly for timber. After the timber was cut, much of the land especially around Nederland was allowed to revert to the Counties for taxes. Large blocks of land within the unit were consolidated into private ownership by payment of back taxes.

During the past 100 years or so most of the project area has been intensively used by man for mining, logging, grazing and other purposes. Many of the old mining camps have been abandoned; however, in recent years much of the private land has been re-developed for both seasonal and year long residences.

The State of Colorado Historic Sites Inventory contains two entrys within the pilot project area. One is the Switzerland Trail which was constructed and used by the Union Pacific Railroad Company during the 1880's. The other is a pioneer cemetery which contains graves dating back to 1858. The graves are those of miners and other individuals of some importance.

The National Register of Historic Places has been consulted and no properties are listed within the area of the pilot project. The Colorado State Historic Preservation Officer advises that no properties within the area are currently pending nomination to the National Register of Historic Places.

Transportation

The asphalt surfaced Colorado 119, Boulder Canyon Drive, is the major road through the area. The gravel surfaced Sugarloaf County collector road provides access to the north portion of the area. Unsurfaced Peewink and Upham Gulch Forest Roads connect to the west end of Sugarloaf Road. The gravel surfaced Magnolia Drive and Forsythe Canyon County roads provide access to the south portion of the study area. Gross Reservoir Forest Road accesses the Winiger Gulch area from Magnolia Drive.

Boulder Canyon Drive between Boulder and Nederland parallels Little Boulder Creek and receives heavy traffic. Boulder County mountain subdivisions and tourists travel accounts for 2500 cars per day as measured in 1975. By 1990, the traffic on this road is estimated to reach 4800. The road has a present day sufficiency rating of only 30 percent indicating the alignment and surface condition of this road is badly deficient. The Colorado State Patrol reports this road is one of the most dangerous in the State.

Other main roads are Colorado 72 through Wonderview, to the South (a road with a sufficiency rating of only 43% and the recently reconstructed Peak to Peak Highway section of Colorado 72 to the west of the study area, with a sufficiency rating of 91%.

The County roads are adequately aligned for 25 to 30 MPH speeds with sufficient signing and law enforcement to safely handle present traffic volumes.

National Forest roads are, for the most part, in primitive condition with the exception of the Gross Reservoir Road which is partially gravelled, ditched, and drained. Forest roads are adequate for todays traffic volumes.

The major impact on the existing transportation system will occur on Boulder Canyon Drive, Colorado 119. Timber hauling and administrative traffic must be coordinated to avoid using this road during summer peak load periods.

Recreation

The attractive mountain scenery, large amounts of open space and the relative closeness to the Denver-Boulder area results in a demand for residences, second homes and general recreation for many people.

The recreation use for the area, was 136,000 visitor days during 1976. The heaviest use occurs in Boulder Canyon and in and around the numerous subdivisions.

Most of the use is dispersed recreation adjacent to major travel corridors. These uses include picnicking, camping, fishing, rock climbing, wood gathering, rock gathering, driving for pleasure, sight seeing, horseback riding, fishing.

Two large reservoirs, Barker and Gross, attract a sizeable number of fishermen each year.

Socio-Economic

Several population characteristics that are significant to the pilot area are: growth rate, educational attainment, and personal income.

Boulder County has grown faster than the state average, increasing in population 77 percent between 1960 and 1970 compared to the state average of 26 percent. This rapid rate continuing into the 70's, prompted the City of Boulder to initiate growth controls through limitation in building permits. This has forced more people to consider residential locations in the mountain subdivisions near the city.

More than 25 percent of the population has four or more years of college or more, compared to the 10 percent state average. People in this area seem to have a great environmental awareness and appreciation that man can inject management to maintain a healthy, vigorous forest environment.

Mean family income is about $1,500 more than the state average. This has allowed more people the opportunity to reside in the more expensive forested areas. Higher incomes allow for more leisure-time, which is often spent in the forest environment.

Socio-Economic Characteristics
Boulder County 1/
TABLE 2

Socio-Economic Characteristics	Boulder County	Colorado
SOCIAL		
Population (1970)	131,889	2,207,259
Percent change (1960-70)	77.6	25.8
Males 18 yrs and older	49.0	48.5
Females 18 yrs and older	51.0	51.5
Age Distribution Percent		
Under 18 yrs	33.0	35.1
19-64 yrs	60.1	56.4
65 and older	6.9	8.5
Population Distribution Percent		
Urban	77.9	78.6
Rural non-farm	19.2	16.7
Rural farm	2.9	4.7
Education (25 yrs or older)		
Percentage by level of school completed		
High School Graduates	75.8	34.4
4 yrs of college or more	26.5	8.5
Median yrs of education	12.8	12.4
Population Density		
Land area (sq. mi)	748	103,776
Density per sq. mi.	176.3	21.3
ECONOMIC		
Income		
Mean Income (families)	12,267	10,875
Median Income (families)	11,196	9,555
Per capita income of persons	3,383	3,118
Percent families ($15,000 or more)	27.1	19.7
Percent families (less than poverty level)	5.6	9.1
Labor Force		
Males (over 16 yrs)	45,295	737,161
Females (over 16 yrs)	47,111	778,621
Percent of Labor Force		
Males (over 16 yrs)	76.7	
Females (over 16 yrs)	43.4	42.6
Unemployment rate of civilian Labor force	4.4	4.2

1/ U.S. Bureau of Census, 1972. U.S. Census of Populations, 1970. General Social and Economic Characteristics, Colorado. U.S. GPO, PC (1)-C7-Colo., Washington, D.C.

Current unemployment for February thru April averaged 6.0. Twenty one percent of Boulder County's employed persons 16 years or older are found in manufacturing and about 18 percent are in education. Employment in industries such as logging and milling is limited and does not significantly affect the counties economy. Outdoor recreation is important, both for the leisure-time activities it provides and for its contribution to the retail trade in the small communities in the project area. The major grazing use is by recreation horses. Livestock production is not a significant economic factor.

Employment
Boulder County 1/
TABLE 3

TYPES OF EMPLOYMENT 1/	Boulder County	Colo.
Total employed (16 yrs or older)	52,482	836,303
Agriculture	978	36,826
Mining	339	13,733
Construction	2,923	51,023
Manufacturing	11,025	118,061
Communications	814	58,347
Wholesale Trade	1,242	
Eating and Drinking Places	1,961	
Gen. Merch. retail	1,187	
Motor vehicle retail/service stations	1,300	
Other retail trade	2,742	
Entertainment and rec. services	437	8,225
Public Administration	3,076	53,604
Education	9,628	
Employed Persons		
Percent in Mfg.	21.0	14.6
Percent in White Collar Occupations	61.1	53.9
Percent Government Workers	25.3	19.8

1/ U.S. Bureau of the Census, 1972. U.S. Census of Populations, 1970. General Social and Economic Characteristics, Colorado. U.S. GPO, PC (1)-C7-Colo., Washington D.C.

Insert pictures

III. ALTERNATIVES

III. Alternatives

The following alternatives were developed by the interdisciplinary and management teams in response to the issues and goals in Section IV, Parts E and F. Each alternative prescribes a set of actions based on certain assumptions or conditions related to their possible implementation. Each will be analyzed and evaluated on its own merits in following sections.

Alternative 1. The basic intent is to let nature take its course with a minimum of influence from man. The following assumptions or conditions apply:

- The beetle epidemic will run its natural course.
- Federal funding of beetle control projects will cease.
- Firewood will be collected on the National Forest, and house logs and "bluestain" timber will be sold.
- A lower quality recreation experience will result for most people.
- Pesticides will not be used.
- Scenic quality and wildlife habitat will be adversely affected.
- Fuel reduction will not be done except in conjunction with timber sales and firewood gathering.
- Mountain Pine Beetle damage will adversely affect property value.
- Statistical analysis of fire occurrence predicts approximately 6 percent of the proposed project area will burn in the next five years.

Alternative 2. The purpose of this alternative is to continue the current program of beetle control at the present level. It includes annual funding, of approximately $743,530, by Federal, State, and private contributions. The following assumptions apply:

- Beetle control will be confined primarily to "direct control" i.e. cutting down and chemically treating or burning infested trees and reducing stand densities through thinning.
- Pesticides lindane and EDB will be used.
- Fuel treatment to reduce fire potential will remain at current levels.
- Scenic quality will be lowered.

- Stand management will be conducted on 440 acres, salvage logging on 475 acres, and direct control on 5,490 acres.

- Some wildlife habitat will be maintained or improved, while some will be adversely affected.

- Statistical analysis of fire occurrence predicts approximately 4 percent of the project area will burn during the next five years.

- Mountain Pine Beetle damage will adversely affect property values outside direct control areas.

Alternative 3. The primary thrust is forest management activities which feature beetle control using methods such as chemical control of beetles, reducing stand density and fuel buildup. The following assumptions apply:

- Vegetation management will be conducted on approximately 25,000 acres.

- The pesticides EDB and lindane will be used.

- Measures to improve wildlife habitat and scenic quality will be included.

- Approximately 2 percent of the proposed project area will burn during the next 5 years according to fire analysis predictions.

- An accelerated fuel treatment program will be done.

- Residential property values will be maintained or increased.

- An operational scale demonstration and test of research results to improve esthetics, fire, beetle proofing and wildlife habitat will be conducted.

IV. ALTERNATIVE ANALYSIS

IV. Alternative Analysis

Each alternative was analyzed by the interdisciplinary team to determine expected differences in outputs, costs, goal satisfaction, and social, economic, and environmental effects. Quantitative ratings were made where possible. Subjective ratings are based on the collective best judgement of the interdisciplinary team when quantitative data was not available for use.

Trade-offs, things gained versus things lost, can also be interpreted from the various tables. For example, in Table 4, if Alternative Two was selected and implemented some big-game winter habitat would be lost in the long-term, and in Table 5, some opportunities would be lost.

A. Outputs of Goods and Services Analysis

Table 4 is a summary of the anticipated differences of goods and services produced by each alternative. Alternative One would result in large decreases of big-game summer and winter habitat quality with the lack of cover and some decrease in fuel reduction which means that the fire (fuel) hazard will be greater. The decrease in developed recreation is caused by the loss of scenic attraction from dead trees.

Domestic cattle grazing was considered and evaluated and was judged to be the same for all alternatives.

Table 4
Output of Goods and Services

Item	Units	Alt. 1	Alt. 2	Alt. 3
Recreation - Developed	+0-	-	0	+
Dispersed	+0-	-	0	++
Property Value Loss Prevented (10 yr. period)	Dollars	0	$475,000	$2,400,000
Water Yield (Long Term)	+0-	0	0	0
Fisheries Habitat (Long Term)	+0-	-	0	+
Wildlife Habitat (Long Term)				
Big Game Summer (cover)	+0-	--	-	+
Big Game Winter (cover)	+0-	--	+	++
Small Game - Non-Game	+0-	-	+	++
Resource Value Loss From Fire Prevented (10 yr. period)	Dollar	$0	$869,500	$5,292,200
Fire Suppression Costs (10 yr. Period) Prevented	Dollars	$0	$198,600	$1,203,300
Standing Timber (Vol/acre at year 50)				
Sawtimber	MMBF	1.0	1.25	9.0
Roundwood	Cunits	0.3	0.4	5,300
Fuelwood	Cunits	2.3	2.6	28,000
Scenery	+0-	-	+	++

Key: ++ Greater Increase
+ Increase
0 Little or No Change
- Decrease
-- Greater Decrease

B. Social Values Analysis

An analysis of social values can not be quantified at this point. One benefit of the proposed pilot project could be to improve methods for evaluating and displaying social (non-dollar) benefits and costs of front range forest management.

Table 5 summarizes the anticipated effects to social values.

Table 5

Effects on Social Values 1/

	Alt. 1	Alt. 2	Alt. 3
Property Values (Private)	--	-	+
Life, Health and Safety	--	-	+
Employment Opportunities	-	+	++
Recreatonal Opportunities	-	0	+

Key: ++ Greater Increase
+ Increase
0 Little or No Effect
- Decrease
-- Greater Decrease

Although it is not possible to provide specific information, certain qualitative comments are appropriate:

- The value of private property within the pilot project area will be most positively affected by Alternative 3. Alternative 1 will cause the greatest negative impact on private property values. Alternative 2 will cause positive impact where treatments are done and negative impact where no treatment is done.

- General protection and life, health and safety is an important aspect of the proposed project. Management that reduces the potential for fire increases such protection.

- Recreational useage and value will likely increase substantially under Alternative 3 because of both increased public awareness and the improvement in visual quality of the area. It could decrease under Alternative 1 because a vista of dead and dying trees is unpleasant to most individuals and because of a concern for fire.

1/ Based on USDA Forest Service, Region 2, 1977 "Land Management Planning Handbook" (Draft).

Alternative One is judged to have the greatest adverse effects on property values and life, health, and safety. Where, Alternative Three has the greatest benefit for educational and employment opportunities.

C. Economic Analysis

An economic analysis was used to indicate the differences among the alternatives related to cost/benefits and project costs.

The benefit/cost ratio measures the predicted relationship of derived benefits to costs, measured in dollars. For example, Alternative Two shows that $1.41 in benefits will result for each $1.00 of cost.

Project costs are those directly associated with the implementation of a particular alternative.

Table 6

Benefit-Cost Analysis

	Alt. 1	Alt. 2	Alt. 3
Benefits/Cost (Ratio)	0.22	1.41	1.89
Net Present Worth ($)	-$258,000	$304,550	$3,099,050

Project Costs

	Alt. 1	Alt. 2	Alt. 3
Initial Cost ($)	$37,890	$190,120	$3,283,430 1/
Annual Maintenance Cost (Yearly)	$37,890	$190,120	$ 34,300
Total 10 year Cost	$378,900	$1,901,200	$3,592,130

1/ Excludes $457,897 manpower programs and $600,000 for research funds.

Alternatives 1 and 2 will make the current volume of wood products available to the general public and local businessmen.

There will be large volumes of wood products which will be easily available on a free basis to the public and at low cost to local businessmen for one or two years in Alternative 3. The price of wood products sold by landowners and businessmen is reduced below what would result from Alternatives 1 and 2.

This one-two year availability will probably not attract new businesses to the area. Established sawmills, and post and pole processors will not be adversely effected. The sawmills, and post-pole processors are located in Fort Collins and Boulder.

The available firewood may decrease the demand to purchase firewood from businesses in the Boulder-Denver area. Most of these firewood sales are a service provided by garden shops and rental shops which get most of their revenue from sales or rental of other products.

Most of the people who buy firewood instead of gathering it free will most likely continue to buy it. There may be a small decrease in firewood sales in the Boulder-Denver area for 1-2 years.

D. Environmental Effects

Of the three alternatives, Alternative 3 has the most favorable effects (Table 7). Alternative 1 has a more adverse effect on air quality, erosion, water quality, and reservoir degradation because of the increased probability of large wildfires. Alternatives 2 and 3 will also have some adverse effects on air quality if wildfires occur and slash is burned.

There will be considerably more noise in the short term from Alternative 3 because of the great amount of activity.

Table 7

Environmental Effects

Item	Alt. 1 Short Term	Alt. 1 Long Term	Alt. 2 Short Term	Alt. 2 Long Term	Alt. 3 Short Term	Alt. 3 Long Term
Effects of Insecticides on						
Wildlife	0	0	-	-	-	0
Stream Fauna	0	0	0	0	0	0
Vegetation	0	0	0	0	0	0
Air Quality	--	-	-	-	-	0
Water Quality	--	-	0	0	-	0
Noise	0	0	-	-	--	0
Soil						
Soil Productivity	-	0	+	+	+	+
Erosion	-	0	-	0	-	+
Reservoir Degradation	-	0	0	0	0	0
Insect Control (One Year)						
Direct Control Ac.	0	NA	5,490	NA	8,800	NA
Improved Stand Condition Ac.	0	NA	440	NA	10,150	NA
Research Value	0	0	0	0	+	++
Visual Quality	--	--	-	-	-	++

Note: Short Term = 1-3 years
Long Term = 4+ years

Key: ++ Greater favorable effect
+ Favorable effect
0 Little or no change
- Adverse effect
-- Greater adverse effect

E. Relationship Between Local Short-Term Uses of Man's Environment and Maintenance and Enhancement of Long-Term Productivity

Alternative 1. There are no significant local short term uses (actions) proposed under this alternative. The lack of action will result in a loss of most of the ponderosa pine and some of the lodgepole pine stands. As they die, scenic quality and wildlife habitat will be degraded. Many recreationists will seek other areas for their outdoor activities, while the residents are left with a less desirable landscape. The potential for fires will increase.

Grasses, forbs and shrub production will increase as the trees die. Soil productivity will not be affected. Over the very long term there will be a slow successional return of ponderosa pine and lodgepole pine forests.

Alternative 2. The local short term uses (actions) proposed under this alternative include direct control of beetles with insecticides and burning, encouraging timber sales and fuelwood gathering, and very limited spraying of trees near valuable developments to control beetle infestation. These actions will reduce the amount of tree loss and fuel buildup in areas where direct control and other management activities occurs. These actions are limited in scope and overall long term effects on productivity will be similar to Alternative 1.

Soil productivity will increase slightly because nutrients will be released to the soil more rapidly from quicker decay of wood and herbaceous material.

Alternative 3. The local short term uses (actions) proposed under this alternative include those summarized in Alternative 2 plus expanded thinning and forest product utilization. Wildfire fuels will be reduced in beetle killed stands, in dense live stands, and in areas where thinning projects or direct control has created dried slash.

Wildlife habitat will be maintained or improved by the proposed management activities.

The long term productivity of trees will be improved. Grass, forb, and shrub productivity will also increase slightly.

F. Irreversible and Irretrievable Commitment of Resources

There are no proposed actions in any of the alternatives that will result in irreversible and irretrievable commitment of resources. None of the area has wilderness characteristics and the efforts to maintain the forest in a certain successional stage with a desired

vegetative composition is not irreversible or irretrievable. All of the area, except the most inaccessible portions has been cut, dug, moved, and otherwise used by man. The commitment to use has already been made.

G. Goal Satisfaction

The goals for management (applicable to each alternative) found on page 8 are analyzed in Table 8. The judgement is based on the interdisciplinary team's perception of the overall long-term effects of each alternative if implemented.

Table 8

Goal Satisfaction

	Goal	Alt. 1	Alt. 2	Alt. 3
1.	Fuel Reduction	0	0	++
2.	Healthy and Attractive Forest	0	0	++
3.	Wildlife Habitat	0	+	++
4.	Improve Scenics	0	+	++
5.	Recreation Opportunities	0	+	+
6.	Beetles at Endemic Level	0	+	++
7.	Economical and Social	0	+	++
8.	Agency and Private Cooperation	0	+	++
9.	Demonstrate Effectiveness	0	+	++

Key: ++ Greater Satisfaction
+ Satisfaction
0 Little or none

V. ALTERNATIVE EVALUTION

V. Alternative Evaluation

The management team, after considering the analysis in Section VII, used the selection criteria on page 8 to evaluate each alternative. The evaluation resulted in a ranking of each alternative to meet the selection criteria (Page 8). Alternative Three was judged to best meet all selection criteria.

Alternative Evaluation - Table 8

Selection Criteria	Alt. 1	Alt. 2	Alt. 3
Best satisfies the management goals	1	2	3
Best maximizes the output of goods and services	1	2	3
Best maximizes favorable effects and minimizes adverse effects	1	2	3
Results in economic efficiency	1	2	3
Results in the greatest social benefits	1	2	3
Best maintains or enhances long term productivity	1	2	3
Provides the fewest irreversible and irretrievable resource commitments	1	2	3

Key: 3 - best satisfies selection criteria
2 - median
1 - least satisfies selection criteria

VI. CONCLUSIONS

VI. Conclusion

A. Alternative Selection

Alternative Three is selected as the proposal because it best satisfies the selection criteria; has the least adverse environmental effects; has the most favorable social effects; and best satisfies the goals of management.

Alternative One was not selected because it potentially had very significant adverse environmental and social effects. The risk of calamity from wildfire was too great. It failed to best satisfy any selection criteria.

Alternative Two was not selected because of the adverse environmental effects, lack of goal satisfaction, and the low potential to better improve the environmental and social conditions.

B. Environmental Statement Recommendation

An Environmental Statement is not appropriate for the proposed action. There is no indication that the Colorado Front Range Vegetative Management Pilot Project is a major Federal action affecting the quality of the human environment, nor are there significant environmental effects that cannot be prevented or mitigated.

VII. MANAGEMENT REQUIREMENTS AND CONSTRAINTS

VII. Management Requirements and Constraints

Soil

1. The type and amount of disturbance following the treatment of the infested areas will determine the type and amount of practices required to minimize soil erosion. Skid trails and hot burn areas are examples of disturbance which will require remedial measures. All sites will be reviewed to determine the best techniques for remedial action.

2. The effects of debris disposal by on-site burning are frequently over-simplified by overlooking the array of soils, geologic type, topography, and hydrologic considerations. A soil scientist and hydrologist will review the sites proposed for burning to determine any undesirable impact from this practice. On larger burns the area will be reviewed for possible revegetative measures if the area is vulnerable to erosion or excessive overland flow.

Air

Prescribed burning will only be conducted when unstable air masses favor smoke dispersal.

Wildlife Constraints

1. Stands of lodgepole and ponderosa pine should be arranged in successional stages and location to provide a high level of habitat diversity for wildlife.

2. Retain and enhance natural openings for wildlife. Provide dense tree hiding cover for twice the sight distance around openings, removing only beetle infested or high risk trees.

3. Preserve habitat for wildlife species with limited ability to adapt to habitat modification.

4. Wet meadow types are especially important habitat on summer elk range. Timber types interspersed with these mesic sites are part of the habitat components which will not be altered or disturbed (deer, elk).

5. Provide 3 to 6 snags per acre for cavity nesting birds and mammals. Their location in relation to other snags and to habitat types such as forest-grassland edge, is important and will be designed to be most effective.

Transportation

1. Transportation systems, especially roads, will receive case-by-case evaluation to reduce their detrimental impact on wildlife. Road density and location are key points to relate to cover, terrain, wildlife movement and specific wildlife objectives.

2. Off-road vehicles shall be prohibited where there may be water quality degradation, resource damage, danger to the using public, or serious conflicts of use after the project is completed.

3. Off-road motor vehicle use will be restricted and managed through Regional Forester authority as specified in Title 36 CFR, Sections 251.25, 261.4, and 295.3 to minimize sedimentation potential and vegetative degradation.

4. Coordinate logging traffic to avoid using Colorado 119 during peak summer recreation travel.

Noise

This intermittent effect cannot be mitigated, but will be explained as part of media releases and public meetings so residents and visitors expect it and recognize that it is a short term effect.

Land Line Location

1. All established land line corners will be protected.

2. Determine ownership of lands and private land line locations before conducting project activities.

Fisheries

1. Maintain a protective strip of vegetation along streams to prevent siltation and degradation of fish habitat.

2. Avoid tree harvest on slopes with high mass movement potential where earthflow can dam or pollute a stream.

3. Fall trees away from streams and treat slash and logging debris so it will not get into the stream.

4. Stream flow alterations, in volume and/or time, will be done only on a planned basis where fisheries are present.

5. High risk trees which can fall into streams will be removed to reduce the potential for debris dams.

6. Log landings, yarding unmerchantable material and similar logging practices will not encroach on the streams. Heavy equipment should be prohibited from operating in or crossing streams except at roads and designated crossings.

Water

1. All project activities which have a potential to degrade water quality will be monitored or inspected during the activity to avert any potential for degradation.

2. Activities adversely affecting water quality will cease until corrective measures are implemented.

3. Dispersed recreation areas experiencing concentrations of public use as a result of the project shall be provided with sanitation facilities, as appropriate, to avoid pollution of adjacent waters.

4. Maintain a no chemical treatment buffer 100 feet from live water. Lakes and contiguous marshes shall be protected and maintained through the use of buffer strips to avoid "spill-over" impacts from adjacent activities.

Timber

1. Excessive wood products produced which will oversupply local markets will be shipped to more distant markets, if possible.

2. Ponderosa Pine

   a. Clearcutting will be reserved as a drastic treatment where there is no alternative for solving severe insect and disease problems. Shelterwood or group selection of from ½ to one acre in size are preferred silviculturally to provide for regeneration.

   b. Dense stands of ponderosa-pine are highly susceptible to mountain pine beetle attack. Post treatment stand densities will be sufficiently low that basal areas will not increase enough to exceed 150 square foot basal area before the time of the next planned cut.

3. Lodgepole Pine

   a. Lodgepole pine index 40 or less will be considered a high windfall risk situation. The cutting choice is limited to removing all trees or leaving the stand uncut. Cleared openings can be up to five acres, interspersed with uncut areas. Cutover areas should not exceed about 1/3 of the total in this risky situation.

   b. Protect stands from windthrow occurance.

   c. Establish a balanced distribution of age classes by stands.

Fire

1. A fire hazard and preattack analysis will be made in favor of public safety prior to implementation of the plan.

General

1. Site specification plans will consider wind as it may effect items, such as:

- blowing over trees where stand densities are reduced,

- snow being blown from cutover areas and being deposited in drifts which close roads,

- blowing smoke into the City of Boulder.

2. Investigate and provide opportunities that will minimize the effect of major supplies of wood products being thrust upon the local market.

3. Coordination with and support from Research will be done during project design for on-the-ground activities.

4. Only state or federal registered insecticides will be used and applied in accordance with the label directions.

5. Prior to any surface disturbing activities in the area of the pilot project, intensive on-the-ground inventories of cultural resources will be compiled under supervision of a qualified archeologist. Appropriate mitigative/protective measures will be executed on sites which are determined to be significant or potentially significant. Cultural resources which are discovered during the course of surface disturbing activities will cause said activities to cease until the Forest Service authorizes resumption.

VIII. CONSULTATION WITH OTHERS

VIII. Consultation With Others

Public concern about the Front Range mountain pine beetle epidemic is tremendous, due to the high visibility of dead trees, the impact on recreation and esthetic values, and proximity to population centers. Correspondingly, concern by the Colorado congressional delegation and State government is also high.

Public concerns have contributed significantly to identifying issues which this environmental analysis addresses. Information and consultation with other jurisdictions was also instrumental in this analysis process.

Boulder County, Colorado State Forest Service (CSFS) and the Forest Service, USDA (USFS) are receiving many letters and phone calls about the pine beetle epidemic. The public strongly supports action to control the beetle epidemic. Common among the concerns expressed are:

Shock and disbelief at the number of trees being destroyed

Impact on the beauty of the Front Range

Threat of catastrophic fire

Deterioration of property values

Federal programs too little, too late

In the past year, CSFS has sponsored or participated in approximately 250 public meetings along the Front Range related to the problem, with USFS personnel participating in many of these. About 50 press releases have been issued, and numerous radio and television programs have focused on the Front Range beetle epidemic. Specific examples of recent information and educational efforts include:

Production by CSFS of a 15-minute color film, "The Silent Killer", about the beetle, its lift history, its destruction, and methods of control.

A 5-part feature series by KOA-TV, Denver, based on the above film, and including interviews with agency personnel, landowners, etc.

Several hand-out publications describing the problem and what needs to be done.

A mountain pine beetle symposium was sponsored by Boulder County on March 8, 1977 with six agencies involved and more than 200 people participating.

Boulder County, CSFS and USFS have received numerous letters, personal and telephone contacts, from U.S. Senators, Representatives and State and local officials. The Colorado delegation has been instrumental in obtaining additional funding for direct control and vegetative management.

Representative press clippings and letters expressing public concern about the mountain pine beetle epidemic are included in Appendix A, along with photographs and publications relevant to this issue.

Intense public and political reaction to the Front Range wildfire potential will probably not come to the fore until after a serious fire has occurred - as has been case with the beetle epidemic.

The Rocky Mountain Forest and Range Experiment Station (Fort Collins) is cooperating in the project. Station biological and physical scientists will review and/or suggest management prescription as well as monitor and evaluate effects following treatment.

The Boulder County Planning Department, the Boulder County Commissioners, and the Boulder County Forester all strongly support the pilot project as well as providing substantial input into this analysis.

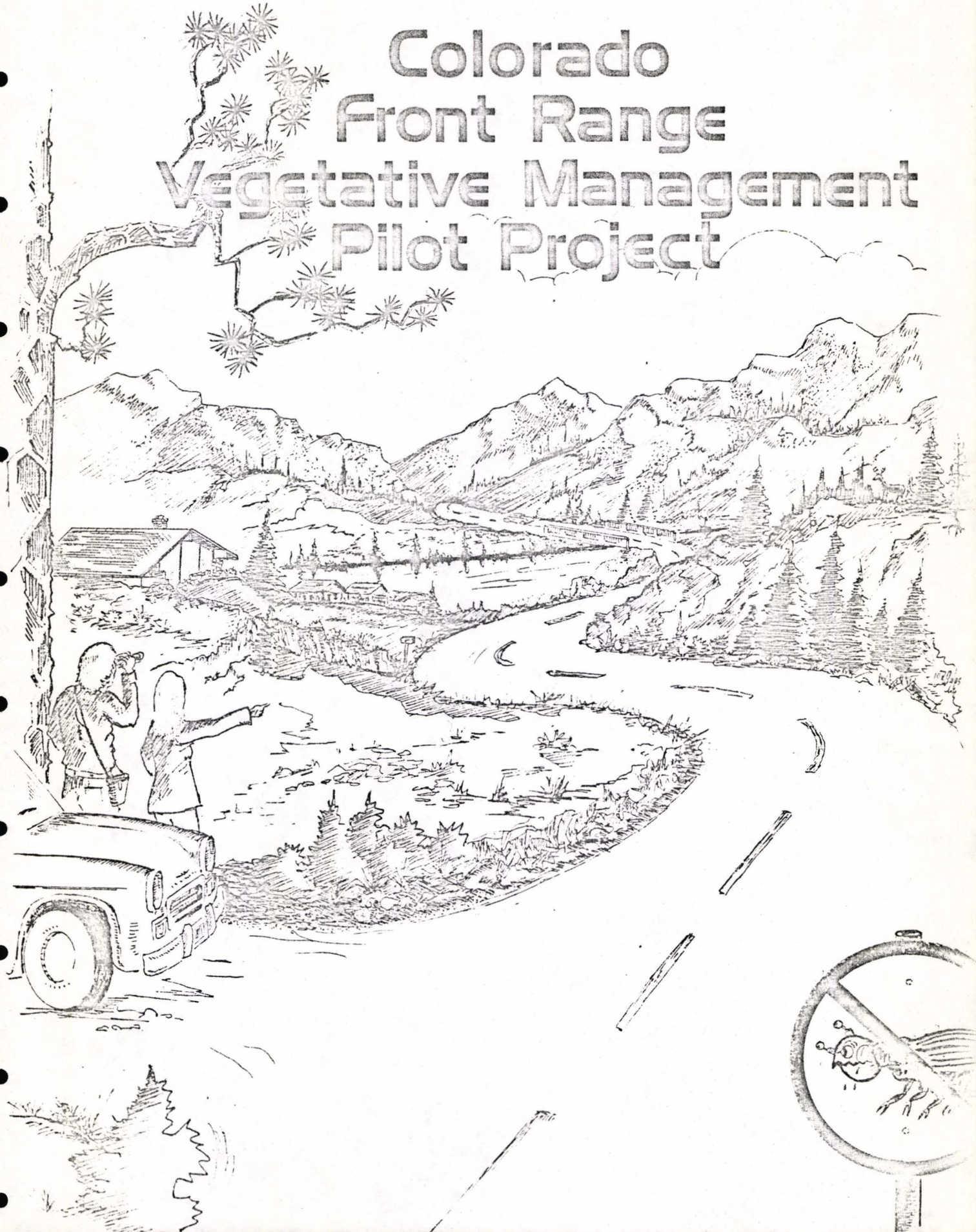
The Boulder County Planning Department has conducted neighborhood meetings in communities on or near the proposed pilot project area. The Planning Department states, "Every neighborhood meeting held for planning purposes saw fire protection, wildlife, forest management, and recreation pressures as key concerns". Out of 789 responses 65 percent thought fire protection and 64 percent thought forest management were of great importance. 1/

1/ From the overview of the Boulder County Planning Departments Study.

IX. APPENDIX

Budget Proposal for the

Colorado Front Range Vegetative Management Pilot Project



COLORADO FRONT RANGE

VEGETATIVE MANAGEMENT

PILOT PROJECT

BUDGET PROPOSAL

Thomas B. Borden, State Forester
Colorado State Forest Service — 6/28/77

Craig W. Rupp, Regional Forester
Region 2, Forest Service, USDA — 6/29/77

for David E. Herrick, Director
Rocky Mountain Station, Forest Service, USDA — 6/28/77

Boulder County
Commissioner, District II — 6-29-77

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General Management Prescriptions

Table 1 - Land Use Information for Five Mountain Planning Subdivisions
Table 2 - Summary Data for Boulder County Pilot Project
Table 3 - Summary of Treatments
Table 4 - Summary of Prescription Costs
Table 5 - Planned Manpower Program Accomplishment

SUMMARY

This is a budget proposal for a pilot application of research results to maintain and protect high recreational values on 34,000 acres of private, Federal and local government lands within Boulder County, in Colorado. The pilot project will consist of a number of intensively applied treatments which will be completed in FY 1978. Evaluation of these treatments on a continuing basis will provide guidance to improve the full scale (585,300 acres) Colorado Front Range Vegetation Management Project. The pilot project will determine the generality of research results on an operational scale, demonstrate the applicability of proposed activities, evaluate the effects of alternate treatments and provide opportunities to improve the cost effectiveness of vegetative management in the rapidly urbanizing mountain zone of the Front Range of Colorado.

Direct control has been used effectively by the Colorado State Forest Service in DCA's (Designated Control Areas), four of which are located within the pilot project boundaries. Vegetative manipulation resulting in basal area reduction has been shown to be effective for mountain pine beetle control. Thinning will be applied to reduce basal area so esthetic and wildlife resources are also enhanced. A research team from the Rocky Mountain Station will help design and evaluate specific activities on the pilot project site to quantify changes in esthetics, protection from beetles and wildlife habitat. This quantification will lead to improved prescriptions and management guidelines for mixed-age class ponderosa pine forests.

Fire hazard reduction is projected for the entire area as a result of improved access, fuel reduction, and fuel break construction. The mixed ownership, heavy population, and high recreational value of lands within the pilot project area, coupled with a low wood product value, create a unique opportunity to study the economics of fire protection and fuel reduction in the Colorado Front Range. The research team will conduct before-and-after treatment studies of the fire hazard to quantify fire potentail and assess changes resulting from various treatments. The costs and benefits of alternative investments will also be evaluated.

The benefits and costs of three alternative approaches to forest management in the 34,000 acres of front range identified have been analyzed. The proposed pilot project is shown to be the most economically efficient of the alternatives.

Detailed information describing the physiological, social and biological attributes of this pilot area are discussed in the Environmental Analysis Report.

Project costs are summarized as below:

SOURCE	FUNDS
State	$ 250,478
Private (includes labor and equipment provided by landowners)	248,274
Forest Service - USDA	3,332,743
Local Government	51,943
Manpower Program	457,889
TOTAL	$4,341,327

Post-treatment evaluation, to guide the full scale project, will require continuation of annual research funding ($600,000) for four subsequent years.

SITE SELECTION

The pilot project area consists of approximately 34,000 gross acres lying west of the Flatirons of Boulder, north of South Boulder Creek, east of the Peak to Peak Highway (Colorado 72) and south of a line running along the mountain tops from Glacier Lake to Sugarloaf Mountain, and then to Boulder Canyon. See Map preceeding page.

This area was chosen as a pilot project as it is typical of the intermixed land ownership found in the ponderosa pine forest of the Front Range of Colorado. The area includes lands administered and/or owned by governments and private landowners as follows:

Ownership	Unit
Bureau of Land Management	600
Denver Water Board	1,200
City of Boulder	800
Boulder County	4,300
City of Nederland	160
National Forest	12,127
Private	15,073
TOTAL	34,260

There are sixteen plotted and developed subdivisions within boundary and four Designated Control Areas (DCA) for mountain pine beetle (MPB) control. In response to public interest, the United States Forest Service, Colorado State Forest Service, and Boulder County have completed the first stages of a forest management and wildfire hazard reduction demonstration area on over 200 acres in one of the most highly populated, densely forested, subdivisions. Several landowners' associations have demonstrated interest in forest management practices, as have the cities of Denver and Boulder. A detailed Forest Management Plan was completed in April 1977, by the Colorado State Forest Service for 6,000 acres within the boundaries, under a General Forestry Assistance project.

Boulder County Planning Department has compiled land use information for five mountain subregions within the pilot project area. This data is summarized as Table 1, in the Appendix. The Bureau of Land Management has submitted a budget proposal for direct control and vegetative management of their lands along the Front Range. They also have an ongoing program of thinning. A small portion of the Bureau of Land Management's program will occur within this pilot project boundary.

Another consideration for choosing this area for the pilot project is the high recreational use the area receives. It is highly visible from both highways and from the air. Cooperation among agencies and landowners in the area is excellent. A severe fuel buildup is aggravated by the mountain pine beetle (MPB) devastation, and thousands of acres of living timber and watershed are presently threatened by both MPB and wildfire.

Table 2, in the Appendix, shows a detailed summary of vegetative types, size class, slope and ownership. Below are the major management condition categories and acreages presently defined.

Management Condition Categroy	Acreage Total	Federal 1/	Private and Local Government
I MPB infested (heavily infested)	7,880	1,921	5,959
II Currently under management	150	66	84
III Stands other than ponderosa pine not susceptible to MPB	6,640	3,333	3,307
IV Threatened by MPB (includes areas of light to moderate MPB infestation)	14,050	5,429	8,621
V No treatment planned 2/	3,370	1,340	2,030
VI Nonforested	2,170	638	1,532
Total project area	34,260	12,727	21,533

1/ Includes Forest Service and Bureau of Land Management.

2/ No treatments are planned on rocky ridge tops or in scattered stands with very low densities.

The above average figures depict the situation on the total ownership within the pilot project area. It is expected that owners of about 75 percent of the private land acres will participate in the project. Budget estimates and acres for the private land are based upon this 75 percent factor. Table 3, in the Appendix, reflects 75 percent of the private land and the costs to treat these acres.

GOALS AND OBJECTIVES

The goal as stated in the Vegetative Management Proposal for the Front Range of Colorado is to achieve a managed, attractive forest.

Broad objectives were established for the Front Range to reach this goal -- to be achieved within five years. They are:

- Stop the current mountain pine beetle epidemic.
- Create stand conditions which will enable prevention of future mountain pine beetle epidemics.
- Accomplish fuel treatment in all stands where preventive treatment for mountain pine beetle is applied.
- Modify stand treatments to create (or maintain) stand diversity for wildlife habitat, apply specific treatments for wildlife habitat improvement, and protect snags needed for wildlife in all treated areas.
- Maintain the scenic quality of the area treated.

The goals of the pilot project are to demonstrate and test, on an operational scale, the effectiveness of management practices designed to achieve a managed attractive forest. To reach these goals, the following objectives have been established to be accomplished in one year:

- Reduce wildfire hazard on 34,260 acres by providing improved fire protection to 18,500 acres, fuel reduction on 17,017 acres, and by constructing fuel breaks on 1,300 acres.
- Improve the scenic quality of the 34,260 acres in the project area through creation of a vigorously managed forest resistant to epidemic mountain pine beetle attacks.
- Create stand conditions which will enable prevention of future insect or disease epidemics, through stand improvement of 13,204 acres, and direct control on 6,515 acres.
- Maintain or improve the recreation opportunities for the area through implementation of all management practices.
- Reestablish acceptable densities of vegetation for wildlife and esthetics on 2,105 acres through seeding of 815 acres, and reforestation of 1,290 acres.

- Improve wildlife habitat through design and application of management practices by seeding wildlife browse and cover species on 815 acres, by providing brush piles on 7,000 acres, and snag protection on 12,127 acres, and thinning dense stands of trees on 11,024 acres.

The following research objectives are established to be accomplished within a 5-year time frame in conjunction with the Colorado Front Range Vegetation Management Project:

- Quantify the social and economic benefits to the public resulting from intensive vegetative management in the mountain zone.

- Evaluate the effects of management practices conducted on an operational scale. Provide refined treatments for continuing management of Colorado Front Range forests.

- Effectively transfer existing and new research information to land managers.

The successful accomplishment of these objectives will substantially improve the abilities of the U. S. Forest Service and other land managers to manage forests in the rapidly urbanizing Colorado Front Range. Moreover, the site specific treatments that evolve as applicable on an operational scale from the pilot study can be transferred to similar ponderosa pine forests throughout the western United States.

The pilot program will be designed to finish all vegetative and other on-the-ground practices within one year. The planned result after one year is a managed, attractive forest available for multiple uses, low in fire hazard, high in wildlife and recreation values, and resistant to insect and disease problems. The research effort, after one year, will result in substantial improvement of the guidelines for treatment of the remaining 500,000 acres of the Front Range. The pilot area will be easily identifiable and be a model area for multiple use management in the populated Colorado Front Range.

ACTIVITIES PROPOSED

A combination of activities will be carried out to accomplish the project objectives.

Specific Management Actions Include:	Unit	Quantity
Reduction of stand density through thinning and removal	Acres	13,204
Direct control, mountain pine beetle		
- Cut and chemically treat, burn or remove	Acres	6,515
Fuel hazard reduction		
- Fuel reduction, pile, burn, chip	Acres	17,017
- Fire protection	Acres	18,000
- Fuel breaks	Acres	1,300
Scenic Quality and Wildlife		
Habitat Improvement.		
- Reforestation by planting including wildlife browse species	Acres	1,290
- Seeding, of wildlife browse and cover species	Acres	815
- Build wildlife brush piles	Acres	7,000
- Protect wildlife snags	Acres	12,127

- Improve current knowledge with regard to the methods and for regeneration in ponderosa pine forests.

Application of the proposed activities shown above will produce the following additional byproducts and benefits:

Transfer of the latest findings from mountain zone research to on-the-ground application, improving professional forest management in the Colorado Front Range.

Protection of the visual quality of the forested area throughout the pilot project area for more than 136,000 annual visitors and about 4,500 area residents.

Improved habitat for bird species which utilize open pine stands (turkey, pine grosbeak, etc.) on 8,000 acres of the total area.

Make wood products, including an estimated 9 MM board feet of lumber, 5,300 cunits of roundwood, and 28,000 cords of fuelwood available for use.

Reduction of fire damage and suppression costs on roughly 34,000 acres.

Improved livestock grazing conditions on about 4,000 acres.

Provide an improved understanding of the opportunities for, and benefits of, forest management of ponderosa pine forests.

Allow a more specific appraisal of the esthetics and recreation potential of treated stands in urbanizing areas.

Increase the ability of land managers to provide cost effective fire protection for the Colorado Front Range.

Protect property values on private lands throughout the pilot project area.

Demonstrate intensive multiple use management on a large area of mixed ownership forested lands of prime scenic, recreational, and wildlife value.

Create a forest management consciousness throughout the pilot project area as well as adjoining areas.

Provide an estimaed 400 person-years of employment.

Specific research activities will involve the establishment of a multidisciplinary team of specialists who will:

- Evaluate the response of users to the esthetic qualities of areas receiving different vegetative treatments.

- Evaluate the response of wildlife on a species specific basis to varying levels of habitat improvement activities.

- Demonstrate the usefulness of thinning in second growth ponderosa pine as a means of mountain pine beetle control.

- Identify site specific parameters which might require modification of thinning prescriptions to increase multiple use benefits.

- Determine utilization potential for the fiber being temporarily removed both from the pilot project area and from the entire Colorado Front Range Vegetation Management Program.

- Quantify the fire hazard reduction resulting from fuel treatment, improved fire access, and fuel breaks.

- Evaluate the economics of fire protection, taking into account presuppression costs, fire readiness costs, and fire fighting costs balanced against values and risk for the Colorado Front Range.

- Appraise the effects of the pilot project with respect to recreation use with special focus on increased accessibility and awareness of the area by post-treatment users.

- Investigate interactions between thinning densities and dwarf mistletoe, root rot, and insect pests.

FUNDING

In order to carry out this project on lands of mixed ownership, funds must come from several sources. Total estimated funding by sources is shown below:

SOURCE	FUNDS
State	$ 250,478
Private (includes labor and equipment provided by landowners)	248,274
Forest Service - USDA	3,332,743
Local Government	51,943
Manpower Program (Contributed)	457,889
TOTAL	$4,341,327

Forest Service - USDA funding will come from a combination of State and Private Forestry cooperative programs, National Forest System functions, and Research, as shown below:

State and Private Forestry		National Forest System		Research
Cooperative Forest Management	$13,600	Timber Stand Improvement	$399,259	
Agricultural Conservation Program	204,984	Commercial Timber Sales	12,800	
Cooperative Fire Protection	785,307	Reforestation	93,311	
General Forestry Assistance	100,940	Stage II Inventory	37,284	
Insect & Disease Control	201,348	Recreation Management	19,844	
ACP and/or I&DC (Funding under review)	202,975	Wildlife Habitat Management	65,107	
		Fire PreSuppression	579,307	
		Soil & Watershed Management	16,617	
TOTAL	$1,509,154		$1,223,589	$600,000

State and Private Forestry and the National Forest System will require a total of $1,632,743 to accomplish the objectives for the pilot project. Research will require $600,000 in FY 1978 in order to initiate the required inventory, study plans, and statistical design for subsequent research. A similar amount is needed for four subsequent years (FY 79-82) for a total research involvement of $3,000,000. To initiate this high priority research, the Rocky Mountain Station proposes to reallocate $250,000 of FY 1978 monies to the Colorado Front Range Pilot Project. However, an additional $350,000 will be needed to establish the program.

This is a budgetary proposal only. Land management objectives, site specific plans, and detailed research plans will determine actual treatments for individual forest stands. Work on site specific plans will start and be completed early in FY 1978.

Work that is planned to be accomplished by NYACC and Title 6 of CETA manpower programs is shown in Table 3. The total funding request has been reduced to reflect this planned accomplishement.

Attainment of the level of accomplishment resulting from these programs is based upon the best estimates of the size and location and availability of these programs. Policy and procedure changes may bring about funding shifts.

Sources of funds to accomplish the various treatments is displayed in the following tables. A description of the individual treatment is found in the Appendix.

REFORESTATION - PLANTING

Source of funds	Ownership/Funds Needed		Total
	Private	National Forest	
Private	$ 42,969		$ 42,969
Agricultural Conservation Program (ACP)	128,906		128,906
USFS - NFS			
Reforestation 033		$ 41,879	41,879
Wildlife 080		6,000	6,000
TOTAL	171,875	47,879	219,754

SEEDING

Source of funds	Ownership/Funds Needed		Total
	Private	National Forest	
Private	$ 13,875		$ 13,875
Agricultural Conservation Program (ACP)	41,625		41,625
USFS - NFS			
Reforestation 033		$ 23,503	23,503
Wildlife 080		4,160	4,160
TOTAL	55,500	27,663	83,163

SITE PREPARATION

Source of funds	Ownership/Funds Needed		Total
	Private	National Forest	
Private	$11,485		$ 11,485
Agricultural Conservation Program (ACP)	34,453		34,453
USFS - NFS Reforestation 033		$ 27,929	27,929
TOTAL	45,938	27,929	73,867

ACP funding for reforestation, seeding and site preparation on private lands is proposed for cost-sharing under the Agricultural Conservation Program (ACP). While the planned treatment is in line with established ACP objectives and priorities, some difficulty is anticipated in securing needed funding at the local level. The amount of funding required would be a major impact on the Boulder County ACP allocation, and competition for funds for forestry (or wildlife) practices vs. agricultural practices is a continuing problem. It may be necessary that a special allocation of ACP funds be made in order to successfully complete this portion of the pilot program.

THINNING

Source of Funds	Ownership/Funds Needed			
	Private	Local Govt.	National Forest	Total
State	$129,480	$ 30,450		$159,930
Private	123,945			123,945
Local Government		33,600		33,600
I&DC and/or ACP (Funding Under Review)	162,025	40,950		202,975
USFS - NFS Timber Stand Improvement 034			$300,339	300,339
TOTAL	$415,450	$105,000	$300,339	$820,789

Potential use of ACP or I&DC funding for thinning on private lands is presently under review. Thinning on non-Federal lands will either be financed from funds appropriated under the Forest Pest Control Act or through the Agricultural Conservation Program. Both require cost sharing with non-Federal funding. The Federal share of this thinning will be either 39 percent of qualifying costs if I&DC funds are used, or a percentage determined by the Federal share of the ACP practice. The estimates above are based on a Federal share of 39 percent. The actual share of the total cost born by the State, local and Federal Government and private landowners may vary depending upon the mix of funds used.

The Forest Pest Control Act makes frequent mention of the need and authorization to prevent forest damage from insects or diseases on all forested lands irrespective of ownership. Thinning of Front Range ponderosa pine stands is the most feasible means of preventing future epidemics of the mountain pine beetle.

STAND IMPROVEMENT - PRODUCT REMOVAL

Source of Funds	Ownership/Funds Needed		
	Private	National Forest	Total
Cooperative Forest Management (CFM)	13,600[1/]		13,600
USFS - NFS			
Timber Sales 031		12,800	12,800
TSI 034		98,920	98,920
TOTAL	13,600	$111,720	$125,320

1/ Financed at 100 percent as State is overmatched.

Funding for technical assistance to private landowners to carryout the proposed thinning with product removal is proposed under the Cooperative Forest Management (CFM) program (which requires minimum 50 percent non-federal matching). Because the State is currently greatly over matching the federal contribution, no additional matching funds are included in this proposal.

An aggressive program to achieve product removal and utilization will be undertaken. Because of the low value of trees for sawtimber and the limited demand for roundwood, it is not possible or desirable to accomplish more than a very small portion through commercial sales. Thinning of these stands will make products available and an aggressive program of property sales, administrative use (free), and programs for collection of fuel wood for personal use will be used to obtain removal.

FUEL TREATMENTS

Source of funds	Ownership/Funds Needed			
	Private	Local Govt.	National Forest	Total
State				
Private				
Cooperative Fire Protection CM2 1/	$778,275	$ 7,032		$785,307
Local Government		2,343		2,343
USFS - NFS Fire Pre-suppresion (115)			$576,622	576,622
TOTAL	778,275	9,375	576,622	1,364,272

1/ Financed at 100 percent level as State is overmatched. A change in current policy is reflected in this financing.

Funding for fuel treatment on private and non-federal public lands is proposed under the Cooperative Fire Protection (CM2) program. Because State and cooperator contributions to the CM2 program (which requires minimum 50 percent non-federal matching) currently greatly overmatch the federal contribution; no additional matching funds are included in this proposal.

MOUNTAIN PINE BEETLE DIRECT CONTROL

Source of funds	Ownership/Funds Needed			
	Private	Local Govt.	National Forest	Total
State	$50,750	$14,500		$ 65,250
Private	56,000			56,000
Local Government		16,000		16,000
Insect & Disease Control (I&DC)	68,250	19,500	$113,598	201,348
TOTAL	175,000	50,000	113,598	338,598

All direct control of mountain pine beetle on National Forest lands will be financed from funds appropriated under the Forest Pest Control Act. Direct control work on non-Federal lands will be cost shared at either 39 percent Federal Forest Pest Control Act funds and the balance from non-Federal matching funds, or by the following formula: Federal share 50 percent for private ownerships of 500 acres or less; Federal share 33 1/3 percent for private ownerships of over 500 acres or less; Federal share 25 percent for non-Federal public lands. The above funding estimates are based upon a Federal share of 39 percent. The Forest Pest Control Act authorizes expenditure of funds appropriated under this Act for suppression of destructive insects or diseases on all forest lands irrespective of ownership.

WILDLIFE HABITAT IMPROVEMENT

Source of funds	Ownership/Funds Needed National Forest	Total
USFS - NFS		
Wildlife 080	$ 46,550	$46,550
TOTAL	46,550	46,550

SUPPORTING ACTIVITIES

Source of funds		Ownership/Funds Needed Private	Local Govt.	National Forest	TOTAL
State		$17,401	$ 7,897		$25,298
General Forestry Assistance (GFA)		69,600	31,340		100,940
USFS - NFS					
Silvicultural Ex.	037			$37,284	37,284
Visual Mapping	070			2,123	2,123
Cultural Resour.	070			17,721	17,721
Fire Pre-Suppres.	115			2,745	2,745
Wildlife	080			8,397	8,397
Soil & Water Management	090			16,617	16,617
TOTAL		87,001	39,237	84,887	211,125

Support costs for state, private, and local government lands are shown as financed by General Forestry Assistance (GFA) funds on a Federal/state match of 80:20. National Forest System support costs have been assigned to the benefiting Protection and Management (P&M) functions.

Unit costs used to develop this budget proposal are based upon estimates of similar work occurring in other areas. They are average unit costs. Experience may show that savings can be experienced as the actual work is accomplished. In addition, accomplishment planned by manpower programs may exceed present estimates. These savings, if they occur, will be used to accomplish additional acres lying adjacent to the pilot project area.

ALTERNATIVES

Three alternatives were considered and analyzed in developing this budget proposal. They are:

1. To let nature take its course with a minimum of influence by man. No investments would be made in the area to control insects or to reduce hazardous fuels.

2. To continue the current program of beetle control at the present level.

3. To initiate the proposed action.

A detailed description and analysis of these alternatives is contained in the Environmental Analysis Report.

BENEFIT/COST ANALYSIS

The three alternatives and the respective benefit/cost ratio, net present worth, and internal rates of return at a 10 percent interest rate are:

Economic Parameter	Custodial Management	Current Direction	Proposed Project
Benefit/Cost Ratio	.22	1.41	1.89
Net Present Worth (M$)	-258.48	304.55	3098.99
Internal Rate of Return	0	28.66	31.23

Based upon attainment of the stated goals and objectives, the proposed project is the most economically efficient alternative. The cost/ benefit analysis contains detailed information on analysis methods used, estimated costs and benefits received.

APPENDIX

A. General Management Prescriptions.

Table 1 Land Use Information for Five Mountain Planning Subregions

Table 2 Summary Data for Boulder County Pilot Project

Table 3 Summary of Treatments

Table 4 Summary of Prescription Costs

Table 5 Planned Manpower Program Accomplishment

APPENDIX

GENERAL MANAGEMENT PRESCRIPTIONS

To accomplish the goals and objectives, an interdisciplinary team developed broad general management prescriptions applicable to each management condition categroy. These general prescriptions are described below, and will be refined and adapted for specific stands within the project area. Table 4 shows a summary of prescriptions by acres for the management condition categories.

TIMBER STAND IMPROVEMENT - PRODUCT REMOVAL

This practice involves the reduction in stand density of mature to overmature stands. Dead, dying, overmature, high-risk and surplus trees will be removed from the forest to reduce fuel loading, improve esthetics, and utilize material as wood fiber. Removal will be accomplished by commercial sales, property sales, and administrative use (free). Where it is not feasible to remove material from the site by these means, normal slash disposal methods will be employed. Additional slash disposal needed to meet fuel reduction needs are covered under fuel reduction. TSI/product removal on private and municipal lands consists of all work needed to get the area ready for commercial sale or utilization of the material including marking, measurement, etc. This practice differs from the thinning practice in that it takes place on sites where product removal is reasonably assured.

SEEDING

Seeding with herbaceous, coniferous, and grass species will be conducted on sites devoid of vegetation primarily to control wind and water erosion and establish desirable forest and wildlife vegetative habitat. The use of seed drills, broadcast methods, and aerial application will be utilized as necessary.

WILDLIFE HABITAT IMPROVEMENT

Vegetation management for wildlife needs is included in this proposal, in two basic categories: (1) modification of the thinning, harvest, and fuel treatment specifications as needed, and (2) additional specific treatments to improve wildlife habitat.

Creation of wildlife openings will be accomplished in conjunction with the thinning and product removal treatments on both Federal and private lands. Since this will be offset by lighter removals to achieve proper density in other stands, no additional costs are included for creating openings. Browse and legume species for wildlife will be planted within the openings.

It is planned to hand build brush piles (average two per acre) on National Forest lands to improve cover for small mammals and birds on about 7,000 acres. Additional work of this kind will be accomplished where fuel treatment work calls for brush piling, by leaving selected piles unburned.

Identifying and signing snags to be saved for wildlife nests and perches will be done on areas to be thinned and products removed and in mature ponderosa pine stands where snag felling is planned.

SUPPORTING ACTIVITIES

This section describes activities needed to support the vegetation and fuel management work outlined above, to assure coordination and accomplishment of multiple benefits:

Soils and watershed analyses will be conducted on areas where treatment is planned, and specific management recommendations will be developed for protection of soils and watershed values. Cost estimates were based on 1.2 percent of fuel treatment costs, 2.5 percent of product removal, and 0.5 percent of thinning costs.

To assist in determining specific stand treatment needed, a modified Stage II inventory will be made on proposed thinning and product removal areas. Cost estimate is based on $3.00/acre for those acres needing this detailed information.

Visual management inventory and mapping will be completed on the total project area as a basis for developing landscape management recommendations. Cost estimate is based on $ .10/acre.

Cultural resource inventory will be required on those areas where soil disturbance or burning is involved. The surveys will provide a basis for modification of planned treatment as needed to protect cultural values. Cost estimate is based on $1.50/acre.

To provide for detailed planning and coordination of fuel treatment, fuels management needs inventory and mapping will be completed for the project area. Cost estimate is based on $ .15/acre.

To identify specific wildlife needs and to provide coordination in implementing the planned treatment, a wildlife habitat prescription and specific management recommendations will be developed for the total area to be treated. Cost estimate is based on $ .50/acre.

Support costs for state, private, and local government lands are shown as financed by General Forestry Assistance (GFA) funds on a Federal/State match of 80:20.

Fuel Breaks

This practice will consist of reducing the stand density of continuous overdense young stands through cutting of trees to the spacing necessary to contain fire on the ground. Resultant slash will be disposed of by piling and burning, chipping, or lopping and scattering.

Prescribed Burning

Prescribed burning will be conducted in heavily mistletoed areas and areas of high fuel concentration where feasible. Broadcast burning, and piling and burning will be used as appropriate. Burning will cleanse stands of uncontrollable mistletoe, consume unwanted fuels, strengthen the effectiveness of fuel breaks, and prepare the sites for various species of vegetation. Sufficient brush piles will remain for wildlife habitat. Prescribed burning will be followed by seeding or tree planting in some instances. All prescribed burning will be done in accordance with local air pollution controls and local burning regulations. Prescribed burning will be used on some acres where thinning has been accomplished and additional fuel reduction is needed to meet fuel reduction goals.

Site Preparation

Site preparation will be used in conjunction with seeding and planting where an adequate seedbed is not available. The practice will include scarification, mechanical brush chopping, or diversions where erosive nature of the site dictates such practices. Site preparation speeds the process of reestablishing desirable species of vegetation.

Reforestation

Reforestation will be accomplished in areas where the insect epidemic has killed large areas of trees and a natural seed source is not available. It will be accomplished by the planting of seedlings and by seeding. Desired results of reforestation are to maintain and improve the scenic quality, improve wildlife habitat and provide watershed protection benefits. Wildlife browse species will be planted where needed and desirable.

Fire Access

Stands not presently accessible will require at least minimal fire access to provide protection from fire. An overall fire access plan will be devised including public and private ownerships. Cooperative agreements will be drawn and actual clearing of access lanes will be conducted as necessary. Design of the fire access lanes and clearing will be done so as to maximize edge effect for wildlife habitat. Lanes will consist of cleared ways. Construction of roads is not planned.

Monitoring

This practice is record keeping and establishment and maintenance of photo points. Photo points will be established in representative areas of differing treatments. Progress will be recorded from the beginning through accomplishment of the planned treatment. Followup photos and records will be developed as necessary.

Fuel Reduction

Fuel reduction is pruning, windrowing, chipping, piling, burining or removal of flammable material to reduce the quantity, continuity, and size of the fuel. Continuous areas of standing dead material that are a threat will be felled and removed or disposed of on the site. Acres treated will be protected from potentially disastrous wildfire. This practice will be accomplished on areas receiving other treatment such as thinning as well as on acres not otherwise treated. The treatment will also create desirable wildlife habitat and improve esthetics. Some heretofore unused material, such as limbs and tops, will be used for fuel and energy production.

Thinning

Thinning will reduce stand density. Basal area (depending upon site) will be reduced to the growing stock level nedessary to preclude epidemic insect attacks and/or those needed to meet stated goals for the area. Benefits include increased vigor in the residual stand, faster growth, less susceptibility to insect and disease problems, and lower fire hazard by increasing the distance between crowns. Thinning, by allowing more light to reach the forest floor, also increases vegetation available for wildlife food. Water yield is increased because snow and rain are more readily collected in the forest floor instead of lodging in and evaporating from the crowns. In many cases the esthetics of an area are improved by eliminating visual barriers.

Direct Control

Direct control will consist of burning, peeling the bark, chipping, or chemically treating infested trees after they have been felled. Situations where direct control measures may be used are: (1) untreated areas where infested trees pose a threat to management objectives in adjacent stands; (2) DCA's where infested trees will not be removed or the broods destroyed, as part of other treatments; and (3) where green trees felled in various treatments become infested and are a threat to management objectives in surrounding green stands.

The benefits of direct control are the immediate reduction of the number of MPB and a reduction in the number of newly infested trees. These reductions in turn reduce the fire hazard, improve esthetics and maintain property values.

TABLE 1

LAND USE INFORMATION

COMPLETE FOR 5 MOUNTAIN PLANNING SUBREGIONS

COAL CREEK, MAGNOLIA, FLAGSTAFF, NEDERLAND & SUGARLOAF

I. Land Use Statistics

A. Acreage - 38,932

Estimates private - 17,519 (45%)
public - 21,413 (55%)

B. Subdivisions

No.	Acreage	% of Private	# Lots	# Permits	# Vacant	Existing Pop.	Potential Pop.
16	1,967	11%	936	274 (32%)	560 (68%)	.670	1,344

C. Settlements

No.	# Residences	Existing Pop.
6	83	542

D. Parcels

# Residences	Existing Pop.	Estimated Vacant	Potential Pop.
510	1,224	636	2,750

TOTAL

# Residences	Existing Pop.	Potential Pop.	
867	2,080	6,164	(add vacant lots x 2.4 + existing pop.)

II. Existing Land Uses - Facilities

A. Recreation Areas - 5

1. Gross Reservoir
2. Barker Reservoir
3. Boulder Falls
4. Boulder Canyon
5. Boulder Mtn. Parks

Highest intensity during summer, i.e., 7000 vehicles per day on an average weekend up Boulder Canyon. Year round use is on the increase.

B. Transportation Corridors - 5

1. Boulder Canyon (Colo. 119)
2. Sugarloaf Road (Colo. 122)
3. Magnolia Drive (Colo. 132)
4. Flagstaff/Gross Reservoir (Colo. 77)
5. Coal Creek Drive (Colo. 72)

- Boulder Canyon running over rated capacity
- Sugarloaf slated for paving by 1981
- Coal Creek major Denver Metro access corridor
- Flagstaff heavily used in summer
- Nederland sited on major crossroad to higher elevation recreation area
- Intensity of traffic in Boulder Canyon collector roads, thereby increasingly saturating lands around Boulder County
- With the exception of Lower Magnolia, access by standard passenger cars to lands is good on primary and secondary roads

C. Fire Protection

Certain areas (N. Boulder Creek, back of Boulder Mountain Parks, south side of Boulder Canyon, upper end of Eldorado Springs Canyon, Winiger Ridge, area east of Nederland and north of Magnolia Road) would be difficult to move vehicles into. Recreastion areas are largely at the foot of these relatively inaccessible areas.

III. Mountain Planning Team Questionnaire Results*
*(based on the 5 subregions as totals - 789 responses)

A. Fire Protection	Forest Management
1) Importance -	
a. none - 37 (4%)	49 (6%)
b. some - 49 (6%)	161 (20%)
c. great - 515 (65%)	503 (64%)
2) Return on Tax Dollar	
a. No - 129 (16%)	256 (33%)
b. No opinion - 228 (28%)	209 (26%)
c. Yes - 291 (36%)	184 (23%)

B. Control of Recreational Uses

1) Yes - 428 (54%)
2) No - 152 (19%)
3) Unsure - 140 (17%)
4) No Opinion - 38 (4%)

Questionnaire

Total

Ranking (15 topics). If "Yes" what needs control?

1	(1)	Off road-vehicles	162
3	(2)	Camping	90
4	(3)	Fires	71
8	(4)	Hunting/firearms	41
10	(5)	Trespassing	23

**C. Federal Land Management Reflecting Local Concerns

(1)	Most of time	55 (16%)
(2)	Some of time	136 (41%)
(3)	None of time	58 (17%)
(4)	No opinion	80 (24%)

** Resident responses only - total 329 residents replied.
This total is not broken into resident, seasonal, nonresident; it can be.

* This total does include those who didn't answer a particular question; therefore the responses to each topic may not = 789.

TABLE 2 SUMMARY DATA[1/] FOR BOULDER COUNTY PILOT PROJECT -- FRONT RANGE VEGETATION MANAGEMENT PLAN.

Stand Size Class/ Type/Stocking	Gross Acres	Private Acres	% Total	Federal Acres	% Total	Slope-80% Acres	Slope -45% Acres	MPB/SBW[2/] Infested	Under Mgmt.	Area Threatened
Sawtimber Sized Stands (9.0" DBH+)										
Ponderosa Pine 9A	10,090	8,960	88%	1,130	12%	3,160	2,400	5,830	10	10,090
Lodgepole 9A	1,130	550	49%	580	51%	340	180	30	-	
Douglas fir 9M&W	50	10	20%	40	80%	-	-	-	-	
Total Sawtimber	11,270	9,520	84%	1,750	16%	3,500	2,580	5,860	10	10,090
Post/Pole Sized Stands (5.0-9.0"DBH)										
Ponderosa pine SM&W	9,050	5,520	60%	3,530	39%	2,320	1,560	4,780	140	9,050
Ponderosa pine 8P	3,620	840	23%	2,780	77%	2,030	1,620	810	-	3,620
Lodgepole 8W	4,520	2,000	44%	2,520	56%	1,530	1,070	-	-	
Lodgepole 8M&P	1,720	980	57%	740	43%	70	50	-	-	
Douglas fir	1,910	1,330	70%	580	30%	930	740	610	-	1,910
Total Post/Pole Sized Stands	20,820	10,670	51%	10,150	49%	6,880	5,040	6,200	140	14,580
Total Forested	32,090	20,190	63%	11,900	37%	10,380	7,620	12,060	150	24,670
Total Nonforested	2,170									
Total Area	34,260									

1/ Data was collected at a forty-acre minimum

2/ MPB - Mountain Pine Beetle; SBW Spruce Budworm

TABLE 3

SUMMARY OF TREATMENTS

	TOTAL TREATMENTS BY OWNERSHIPS						PLAN. ACCOMP. W/MANPOWER PROGRAMS				BALANCE TO FUND					
	TOTAL		Forest Service		Private & Local Govt.		Forest Service		Private & Local Govt.		TOTAL		Forest Service		Private & Local Govt.	
PROPOSED TREATMENTS	Acres	Cost	Acres	Cost	Acres	Cost	Acres	Value	Acres	Value	Acres	Cost	Acres	Cost	Acres	Cost
Reforestation-Planting	1,290	246,195	360	71,820	930	174,375	360	23,940	40	2,500	2,500	219,756	360	47,881	930	171,875
Seeding	815	83,164	260	27,664	555	55,500	0	0	0	0	815	83,164	260	27,664	555	55,500
Site Preparation	1,155	73,868	420	27,930	735	45,938	0	0	0	0	1,155	73,868	420	27,930	735	45,938
Fuel Treatments	17,017	1,141,426	6,866	456,589	10,151	684,537	1,275	84,787	435	27,187	17,017	1,029,452	6,866	371,802	11,111	657,650
Fire Access	18,500	81,470	10,000	45,220	8,500	36,250	0	0	0	0	18,500	81,470	10,000	45,220	8,500	36,250
Fuel Breaks	1,300	253,350	800	159,600	500	93,750	0	0	0	0	1,300	253,350	800	159,600	500	93,750
Wildlife Habitat Imp.	7,000	46,550	7,000	46,550	0	0	0	0	0	0	7,000	46,550	7,000	46,550	0	0
TSI-Product Removal	2,180	1,942,001	1,640	159,600	540	34,600	700	47,880	140	21,000	2,180	125,320	1,640	111,720	500	13,600
Thinning	11,024	992,185	4,926	458,610	6,098	533,575	1,700	158,270	150	13,125	11,024	820,789	4,926	300,339	6,098	520,450
Direct Control	6,515	417,795	2,765	183,420	3,750	234,375	1,100	69,825	150	9,375	6,515	338,595	2,765	113,595	3,750	225,000
Monitor	5,614	7,606	3,161	4 377	2,453	3,229	0	0	0	0	5,614	7,606	3,161	4,377	2,453	3,229
Supporting Activities	0	203,518	0	80,509	0	123,009	0	0	0	0	0	203,518	0	80,509	0	123,009
Acres Not Treated	3,370	0	1,340	0	2,030	0	0	0	0	0	0	0	0	0	0	0
Total Acres & Dollars 1/	26,046	3,741,327	12,127	1,721,889	13,919	2,019,438		384,702		73,187		3,283,438		1,337,187		1,946,251
Private Acres Untreated	6,082				6,082											

1/ Total acres includes all Forest Service, private and local government lands.

2/ Total acres includes all Forest Service, private and local government lands to receive treatment including acres accomplished by manpower programs.

TABLE 4

SUMMARY - PRESCRIPTION COSTS FOR BOULDER COUNTY PILOT PROJECT - FRONT RANGE

VEGETATION MANAGEMENT BUDGET PROGRAM

PROPOSED TREATMENT	ACRES TO BE TREATED						COSTS IN DOLLARS		
MOUNTAIN PINE BEETLE INFESTED	Total Acres	Forest Service	Private	Treatment and Acres	Fed.	Pvt.	Federal Lands	Private Lands	Total $
Sawtimber (9.0" DBH +)									
Ponderosa pine	3,495	538	2,957	a) Seeding	60	330	$ 6,379	$ 33,000	$ 39,379
				b) Salvage Harvest	400	400	31,820	10,000	41,920
				c) Prescribed burn	120	660	7,980	41,250	49,230
				d) Site preparation	60	330	3,990	20,625	24,615
				e) Reforestation	120	660	23,940	123,750	147,690
				f) Fuel Reduction	400	1,793	26,600	112,063	138,663
				g) Fire Access	538	1,784	2,432	7,618	10,050
Lodgepole pine	0			h) Wildlife Hab. Imp.	538		3,578		3,578
Douglas fir	0			i) Thin	100	1,000	9.310	87,500	96,810
Post/Pole Trees (5.0"-9.0" DBH)									
Ponderosa pine 8 M & W	2,550	1,200	1,350	a) Seeding	200	225	21,265	22,500	43,765
				b) Salvage Harvest	400	200	31,920	5,000	36,920
				c) Prescribed burn	400	450	26,600	28,125	54,725
				d) Site preparation	200	225	13,300	10,463	23,763
				e) Reforestation	200	225	39,900	42,188	82,088
				f) Fuel Reduction	800	900	53,200	56,250	109,450
				g) Fire Access	1,200		5,424		5,424
				h) Wildlife Hab. Imp.	1,200		7,980		7,980
				i) Thin	600	850	55,860	74,375	130,235
Ponderosa pine 8P	340	160	180	a) Site preparation	160	180	10,640	11,250	21,890
				b) Reforestation	40	45	7,980	8,438	16,418
				c) Fuel Reduction	160	180	10,640	11,250	21,890
				d) Fire Access	160		723		723
				e) Wildlife Hab. Imp.	160		1,064		1,064
Lodgepole pine	0								
Douglas fir	0								
TOTAL	6,385	1,898	4,487				$402,625	$705,645	$1,108,270

TABLE 4

SUMMARY - PRESCRIPTION COSTS FOR BOULDER COUNTY PILOT PROJECT - FRONT RANGE

VEGETATION MANAGEMENT BUDGET PROPOSAL

PROPOSED TREATMENT	ACRES TO BE TREATED						COSTS IN DOLLARS		
	Total Acres	Forest Service	Private	Treatment and Acres	Fed.	Pvt.	Federal Lands	Private Lands	Total $
II CURRENTLY UNDER MANAGEMENT									
Sawtimber (9.0" DBH+)									
Ponderosa pine 9A	10	5	5	a) Direct control	5	5	$ 332	$ 313	$ 645
Lodgepole 9A	0			b) Monitor	5	5	7	7	14
Douglas fir 9 M&W	0								
Post/Pole Timber (5.0"-9.0" DBH)									
Ponderosa pine 8 M&W	120	60	60	a) Direct control	60	60	3,980	3,750	7,730
				b) Monitor	60	60	83	79	162
Ponderosa pine 8P									
Lodgepole 8W									
Lodgepole 8 M&W									
Douglas fir 8									
TOTAL	130	65	65				$4,402	$4,149	$8,551

TABLE 4

SUMMARY - PRESCRIPTION COSTS FOR BOULDER COUNTY PILOT PROJECT - FRONT RANGE

VEGETATION MANAGEMENT BUDGET PROPOSAL

PROPOSED TREATMENT	ACRES TO BE TREATED						COSTS IN DOLLARS		
	Total Acres	Forest Service	Private	Treatment and Acres	Fed.	Pvt.	Federal Lands	Private Lands	Total $
III NOT SUSCEPTABLE									
Sawtimber (9.0" DBH+)									
Ponderosa pine 9A	0								
Lodgepole 9A	0								
Douglas fir 9 M&W	48	40	8	a) Fire access	40	8	181	34	215
				b) Harvest	20	0	3,192	0	3,192
				c) Monitor	40	8	55	11	66
				d) Fuel Reduction	40	8	2,660	500	3,160
Post/Pole Timber (5.0`-9.0" DBH)									
Ponderosa pine 8 M&W									
Ponderosa pine 8P	370	308	62	a) Monitor	308	62	425	82	507
				b) Fire Access	308		1,392		1,392
Lodgepole 8W	2,670	1,680	990	a) Fire access	1,680	990	7,594	4,227	11,821
				b) Thin	1,680	990	156,408	86,625	243,033
				c) Monitor	1,680	990	2,318	1,307	3,625
				d) Fuel Reduction	1,680	990	111,720	61,875	173,595
				e) Wildlife Hab. Imp.	1,318		8,765		8,765
Lodgepole 8 M&P	1,432	718	714	a) Fire access	718	714	3,245	3,049	6,294
				b) Monitor	718	714	991	942	1,933
Douglas fir	964	350	614	a) Fire access	350	614	1,582	2,622	4,204
				b) Monitor	350	614	483	810	1,293
TOTAL	5,484	3,096	2,388				301,011	162,084	463,095

TABLE 4

SUMMARY - PRESCRIPTION COSTS FOR BOULDER COUNTY PILOT PROJECT - FRONT RANGE

VEGETATION MANAGEMENT BUDGET PROGRAM

PROPOSED TREATMENT	ACRES TO BE TREATED						COSTS IN DOLLARS		
	Total Acres	Forest Service	Private	Treatment and Acres	Fed.	Pvt.	Federal Lands	Private Lands	Total $
IV. THREATENED									
Sawtimber (9.0" DBH+)									
Ponderosa pine 9A	2,494	384	2,110	a) Harvest	250	1,150	39,900	22,500	62,400
				b) Direct Control	360	1,900	23,882	118,750	142,632
				c) Fuel Reduction	360	1,900	23,940	118,750	142,690
				d) Fire Access	384		1,736		1,736
				e) Wildlife Hab. Imp.	384		2,554		2,554
				f) Thin	100	338	9,310	29,575	38,885
Lodgepole 9A	835	485	350	a) Harvest	150	250	23,940	7,500	31,440
				b) Direct Control	15	10	995	625	1,620
				c) Fuel Reduction	165	60	10,973	3,750	14,723
				d) Fire Access	485	350	2,192	1,495	3,687
				e) Wildlife Hab. Imp.	485		3,225		3,225
				f) Thin	300		27,930		27,930
Douglas fir	0								
Post/Pole Timber (5.0"-9.0" DBH)									
Ponderosa pine 8 M&W	3,700	1,740	1,960	a) Harvest	420	100	67,032	15,000	82,032
				b) Thin	1,320	1,850	122,892	161,875	284,767
				c) Fuel Reduction	1,400	1,570	93,100	98,125	191,225
				d) Direct Control	1,400	1,570	92,876	98,125	191,001
				e) Fire Access	1,740	1,960	7,865	8,369	16,234
				f) Fuel Breaks	435		86,783		86,783
				g) Wildlife Hab. Imp.	1,740		11,571		11,571
Ponderosa pine 8P	1,130	925	205	a) Fuel Reduction	925	205	61,503	12,813	74,326
				b) Direct Control	925	205	61,365	12,813	74,178
				c) Fire Access	925		4,181		4,181
				d) Wildlife Hab. Imp.	925		6,151		6,151
				e) Thin	259		24,113		24,113
Lodgepole 8W	400	250	150	a) Thin	240	140	22,344	12,250	34,594
				b) Fuel Reduction	110	65	7,315	4,063	11,378
				c) Fire Access	250	150	1,130	641	1,771
				d) Fuel Breaks	125		24,938		24,938
				e) Wildlife Hab. Imp.	250		1,663		1,663
Lodgepole 8 M&P	0								
Douglas fir	0								
TOTAL	8,559	3,784	4,755				$867,409	$727,019	$1,594,428

TABLE 4

SUMMARY - PRESCRIPTION COSTS FOR BOULDER COUNTY PILOT PROJECT - FRONT RANGE

VEGETATION MANAGEMENT BUDGET PROPOSAL

PROPOSED TREATMENT	ACRES TO BE TREATED						COSTS IN DOLLARS		
	Total Acres	Forest Service	Private	Treatment and Acres	Fed.	Pvt.	Federal Lands	Private Lands	Total $
V. 1/ EXCLUSIONS									
(Slopes greater than 45%)									
Ponderosa pine 9A	1,000	90	910	a) Thin	45	410	4,190	35,875	40,065
				b) Fuel Reduction	56	100	3,724	6,250	9,974
				c) Fuel Breaks	45	500	8,978	93,750	102,728
				d) Fire Access	90	910	407	3,886	4,293
Lodgepole 9A	180	90	90	a) Fire Access	90	90	407	384	791
Douglas fir 9 M&W	0	0	0						
Ponderosa pine 8 M&W	260	170	90	a) Fire Access	170	90	768	384	1,152
				b) Fuel Break	85		16,957		16,957
				c) Thin	100	60	6,650	3,750	10,400
				d) Fuel Reduction	100	60	6,650	3,750	10,400
Ponderosa pine 8P	420	350	70	a) Thin	252	50	23,461	4,375	27,836
				b) Fuel Reduction		50		3,125	3,125
				c) Fire Access	252		1,139		1,139
Lodgepole 8W	720	400	320	a) Thin	200	150	18,620	13,125	31,745
				b) Fuel Reduction	150	200	9,975	12,500	22,475
				c) Fire Access	400	320	1,808	1,366	3,174
Lodgepole * M&P	50	20	30						
Douglas fir (8)	740	220	520	a) Fire Access	220	520	994	2,220	3,214
				b) Fuel Breaks	110		21,945		21,945
				c) Thin	110	260	10,241	22,750	32,991
TOTALS	3,370	1,340	2,030				$136,914	$207,490	$244,404

1/ This is total acres excluded because of excessively steep slopes.

TABLE 4

SUMMARY - SUPPORTING ACTIVITIES COSTS FOR BOULDER COUNTY PILOT PROJECT

FRONT RANGE VEGETATIVE MANAGEMENT PROPOSAL

ITEM	TOTAL COST	FOREST SERVICE COST	PRIVATE AND LOCAL GOVERNMENT COST
Supporting Activities	$189,848	$72,304	$117,544

TABLE 5

FRONT RANGE VEGETATION MANAGEMENT PILOT PROJECT

PLANNED MANPOWER PROGRAM ACCOMPLISHMENT

Available

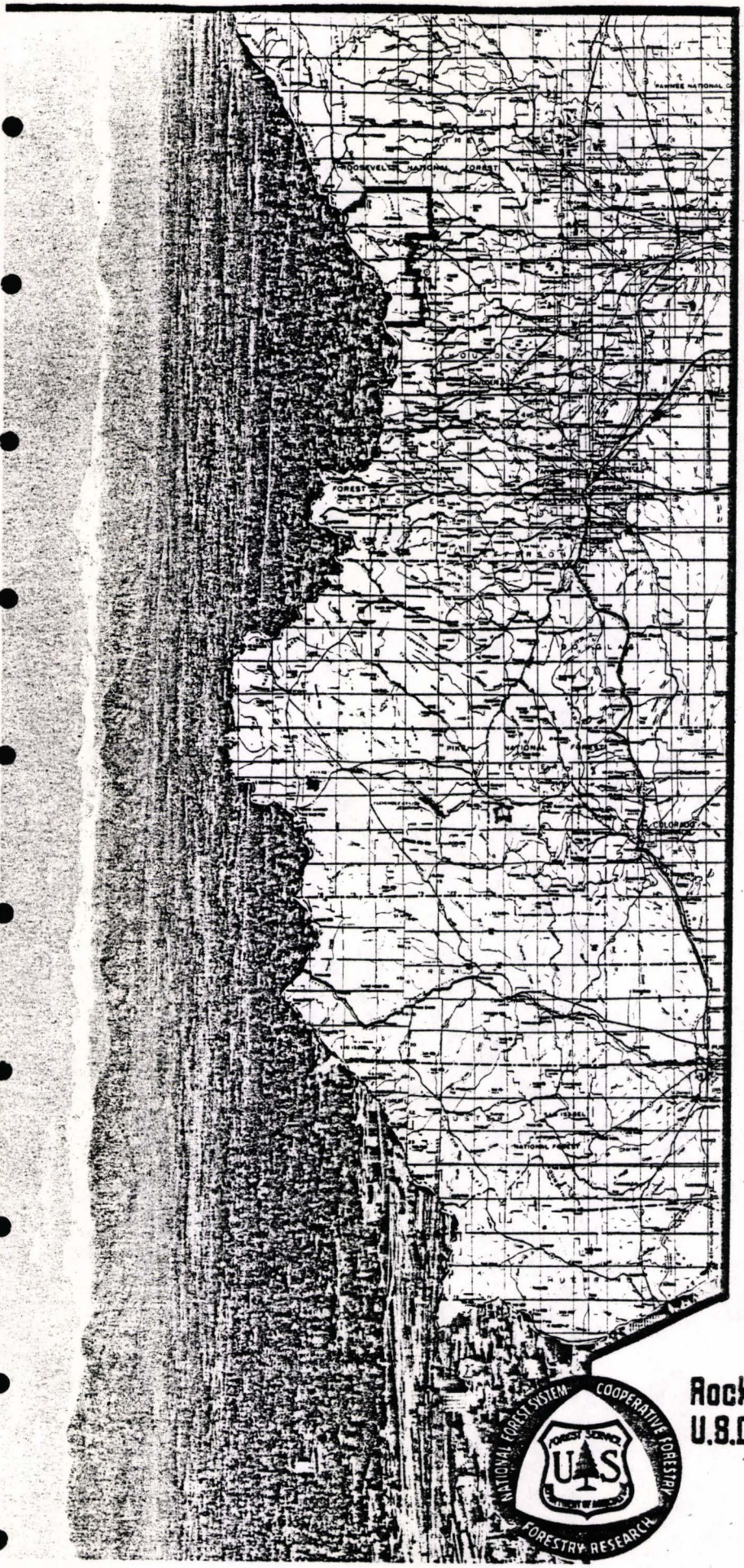
Federal = NYACC	100 man-years	=	25,000 man-days
State = Title G CETA	15 man-years	=	3,750 man-days
			28,750 man-days

Job Description	Manpower Man-Days Fed.	State	Productivity A/man-day	Accomplishment Federal Acres	Cost $	State Acres	Cost $
Prescribe burn							
Salvage harvest[1/]	3,500		.2	700	36,000		
Harvest		700	.2			140	16,800
Reforestation	1,500	100	.25	360	18,000	40	2,000
Direct control	5,255	750	.2	1,100	52,500	150	7,500
Fuel reduction	6,250	1450	.2	1,275	63,750	435	21,750
Thinning	8,500	750	.2	1,700	119,000	150	10,500
Overhead					95,452		14,637
TOTAL	25,005	3,750	-	-	384,702		73,187

GRAND TOTAL $ 457,889

1/ Actual job will be a portion of total harvest job: fell, buck, limb, but no haul or centralizing.

APPENDIX B



Colorado Front Range Vegetation Management Budget Proposal

Rocky Mountain Region
U.S.D.A. Forest Service

Colorado State
Forest Service

COLORADO STATE FOREST SERVICE
COLORADO STATE UNIVERSITY

COLORADO

FRONT RANGE

VEGETATION MANAGEMENT

BUDGET PROPOSAL

Thomas B Borden — 4/21/77

THOMAS B. BORDEN (DATE)
State Forester
Colorado State Forest Service
Colorado State University

Craig W Rupp — 5/4/77

CRAIG W. RUPP (DATE)
Regional Forester
Rocky Mountain Region
Forest Service - USDA

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SUMMARY

(This section provides an overview of the entire presentation; details are included in the subsequent INTRODUCTION, CURRENT SITUATION, VEGETATION MANAGEMENT PROPOSAL, TABLES, and APPENDICES).

Extensive pine stands on the Colorado Front Range -- characterized by an over-crowded, decadent condition resulting from lack of vegetation management -- are suffering from a devastating mountain pine beetle epidemic. Continued build-up of forest fuels in these dense stands poses increasing threat of catastrophic wildfire. This condition has gradually developed since the early 1900's. There were far fewer mature trees then due to large forest fires that were common and intensive tree-cutting associated with settlement of the Front Range and the heyday of the mining era.

The Front Range is in the City of Denver's backyard, and that of Pueblo, Colorado Springs, Boulder, Fort Collins, and many smaller communities--a total population of more than two million. Forest recreation use is heavy throughout the Front Range, and large numbers of travelers from all parts of the nation each year use the several highways that cross the area. More than a third of the forested lands are privately-owned, and about 40% of these are occupied by permanent or recreation residences and commercial establishments. The Front Range is the most used forested area in Colorado.

Recreation, scenic, and wildlife values are of primary importance. The mountain pine beetle epidemic and resulting large areas of dead trees have an overall adverse impact, and the increasing wildfire threat is intolerable. Public concern about the pine beetle is tremendous; there is also growing concern about the fire problem, but this will probably not reach its height until a disaster occurs.

Efforts to combat the beetle epidemic have been largely confined to "direct control" -- cutting down and chemically treating or burning infested trees. Colorado State Forest Service has implemented an effective "designated control area" (DCA) concept on the Front Range whereby landowners cooperatively concentrate their control efforts in contiguous areas. Fuel treatment to reduce fire potential is receiving greater emphasis, with the Rocky Mountain Region allocating all of its proposed increases in funds for fuel treatment to the Front Range and Black Hills areas.

Alone, direct control of the pine beetle, while effective in some localized areas, is a losing battle in the long term. Prevention through silvicultural treatment or "getting stands under management," together with direct control, is the recommended means to minimize beetle activity. The rationale behind this approach is to stop the beetle and change stands from "susceptible condition" to a condition more resistant to insects and diseases.

The following figures summarize the Front Range ponderosa and lodgepole pine stand data used for developing this proposal:

Gross area (excluding National Forest Wilderness and designated roadless areas)	1,334,600 acres
Mountain pine beetle-killed (dead or dying; beyond treatment)	61,300 acres
Currently under management (thinned or harvested)	72,900 acres
Natural stand condition OK (not susceptible to pine beetle epidemic)	615,100 acres
Area threatened (needs treatment to prevent continued beetle epidemic)	585,300 acres

The proposal outlines the vegetation management and fuel treatment work needed, and the estimated funding required to meet the goal "to achieve a managed, attractive forest on the Front Range". Developed as a team effort by the Rocky Mountain Region and Colorado State Forest Service, it includes State, private, other non-federal public, and National Forest lands. The idea is to bring the various forest management functions and activities that apply to this land area together into a single coordinated approach. Through this comprehensive program, all activities will be more effective and total costs should be less than conducting programs separately. Proposed work and related funding in the proposal are supplemental to routine work and funding during the project period.

To reach this goal, objectives have been established -- to be achieved within five years -- to:

- Stop the current mountain pine beetle epidemic
- Create stand conditions which will enable prevention of future mountain pine beetle epidemics
- Accomplish fuel treatment in all stands where preventive treatment for mountain pine beetle is applied
- Modify stand treatments to create (or maintain) stand diversity for wildlife habitat and apply specific treatments for wildlfe habitat improvement
- Maintain the scenic quality of the area treated

Primary treatment proposed within the threatened area consists of reducing stand density and a combination of methods of fuel treatment. Various modifications will be applied in the above treatments for wildlife and scenic purposes. Additional treatment for improvement of the wildlife food and cover ratio is also included.

A combination of management actions will be carried out to accomplish the project objectives and produce many desirable results.

Management Actions	Unit	Quantity
°Reduction of Stand Density	acres	322,200
°Direct Control, Mountain Pine Beetle		
- Cut and chemically treat	trees	957,000
°Fuel Treatment		
- Hand-pile and burn, or chip	acres	37,600
- Machine-pile and burn	acres	19,700
- Prescribed burning	acres	12,800
- Machine chopping	acres	7,600
- Fuel breaks	miles	350
°Wildlife Habitat Improvement		
- Create and seed wildlife openings	acres	17,000
- Build wildlife brush piles	acres	85,000
- Protect (sign) wildlife snags	acres	343,000

Application of the management actions as shown above will produce the following additional by-products and benefits:

- Protection of the visual quality of pine stands throughout the Front Range for more than 7 million annual visitors and 2 million area residents

- Increased carrying capacity of about 10% for grazing and browsing species (deer, elk, rabbits, etc.) for 6-8 years following treatment
- Improved habitat for bird species which utilize open pine stands (turkey, pine grosbeak, etc.) on 20-25% of the total area
- Make wood products available, including an estimated 47MM board feet of lumber, 100,00 cunits of roundwood, and 32,000 cords of fuelwood
- Reduction of fire damage and suppression costs on roughly a million acres
- Improved livestock grazing conditions on about 250,000 acres.
- Completing and implementing multiple use management plans on approximately 100,00 acres of privately-owned forested lands
- Providing technical forestry assistance to an estimated 1,000 landowners
- Protecting property values on private lands throughout the Front Range
- Demonstrating intensive multiple use management on a large area of mixed-ownership forested lands of prime scenic, recreational, and wildlife value
- Creating a forest management consciousness throughout the Front Range community
- Providing an estimated 3,800 person-years of employment

In order to carry out this project on lands of mixed ownership, funds must come from several sources. Total estimated funding by sources is shown below:

Source	Funds
State	$3,291,000
Local Agency	382,000
Private (includes labor and equipment provided by landowners)	3,669,000
Forest Service - USDA	38,501,000
TOTAL	45,843,000

Forest Service - USDA funding ($38,501,000) will come from a combination of State and Private Forestry cooperative programs and National Forest System functions, as shown below:

State and Private Forestry		National Forest System	
Cooperative Forest Management	$ 977,000	Timber Stand Improvement	$15,274,000
Forestry Incentives Program	268,000	Commercial Timber Sales	928,000
Agricultural Conservation Program	327,000	Stage II Inventory	609,000
Cooperative Fire Protection	1,743,000	Recreation Management	182,000
General Forestry Assistance	583,000	Wildlife Habitat Management	1,518,000
Insect & Disease Control	5,924,000	Watershed Management	218,000
		Fire Pre-Suppression	9,950,000
TOTAL	$9,822,000	TOTAL	$28,679,000

This is a budgetary proposal only. Land management objectives and site specific plans will determine actual treatments for land units and forest stands.

Work that may be accomplished by National Youth Conservation Corps and similar manpower programs will proportionately reduce the funding requests included in this proposal. Policy and procedure changes may bring about funding shifts among Forest Service programs.

Research findings by Rocky Mountain Forest and Range Experiment Station have been used in developing the proposal, and Research will be closely consulted as detailed planning progresses. The Station advises that execution of the proposed management practices on the Front Range will provide an excellent, broad-scale base upon which to validate and refine research data in the ponderosa and lodgepole pine types.

I INTRODUCTION

Management History

Before white man settled the Front Range its forests were controlled by natural phenomena. Forest stands regenerated themselves, and trees lived through maturity or until they were killed by fire, disease, insects, wind, or another natural cause.

Forest fires ignited by lightning, and some by Indians, burned uncontrolled until reaching a natural barrier or stopped by weather. Large forested areas were burned; new tree seedlings were eventually established through natural regeneration and the cycle was continued.

In the late 1800's and early 1900's, large numbers of settlers, miners, cattlemen, and others came to the Front Range. One of their most valuable resources were trees, and these were cut in large quantities for firewood, homes, railroad ties, mine props, flumes, fences, and a myriad other uses. Man became a dominant force on the land. Photos from that era show large Front Range areas, formerly forested, practically denuded by tree cutting.

As the drastic detrimental effects of indiscriminate tree harvest, overgrazing, and uncontrolled forest fires took their toll on the livelihoods of the new inhabitants -- here and in many other parts of the West -- public demand led to creation of the National Forests. Regulation of tree cutting and fire control were among the first actions taken on these public lands.

Regulation of timber harvest, of course, has continued to the present time. Demand for Front Range timber dropped drastically when the mining boom ended and has remained at a low level because better quality lumber has been imported from other areas.

Over the years, increasingly intense fire prevention and control efforts on the National Forests, as well as State and private lands, have precluded fire from being a major element in the renewal of vegetation on the Front Range.

So, gradually the pine forests have re-established themselves and grown to their present dense, over-crowded, decadent conditions.

Front Range Description

The Colorado Front Range is generally considered that portion of the Rocky Mountains east of the Continental Divide in the northern half of the State, and the eastern slopes of the Sangre De Cristo Range in southern Colorado. It extends from Colorado's northern border with Wyoming to its southern border with New Mexico.

This project is concerned with the Montane Zone of the Front Range - the first timbered belt above the Plains, at elevations from about 6,500 to 9,400 feet. Annual precipitation varies with elevation and latitude, but averages 15-20 inches, of which about 40 percent occurs as snow. There are approximately 110-114 frost-free days annually.

Soils in the northern two-thirds of the Front Range are mostly granitic. To the south, schist, gneiss, and sedimentary sandstone and shales predominate.

The Montane Zone includes grassland parks, stringer meadows, willow bottoms, brushy south-facing slopes, Douglas-fir on north-facing slopes, blue spruce along streams, open stands of trees with a herbaceous understory, and extremely dense stands of ponderosa and lodgepole pine with little more than a mat of needles and twigs on the ground. At lower elevations, ponderosa pine blends into pinon-juniper, shrublands, or grasslands. At higher elevations pine stands blend into spruce-fir. Herbaceous communities are often considered transitional to the climax pine forest.

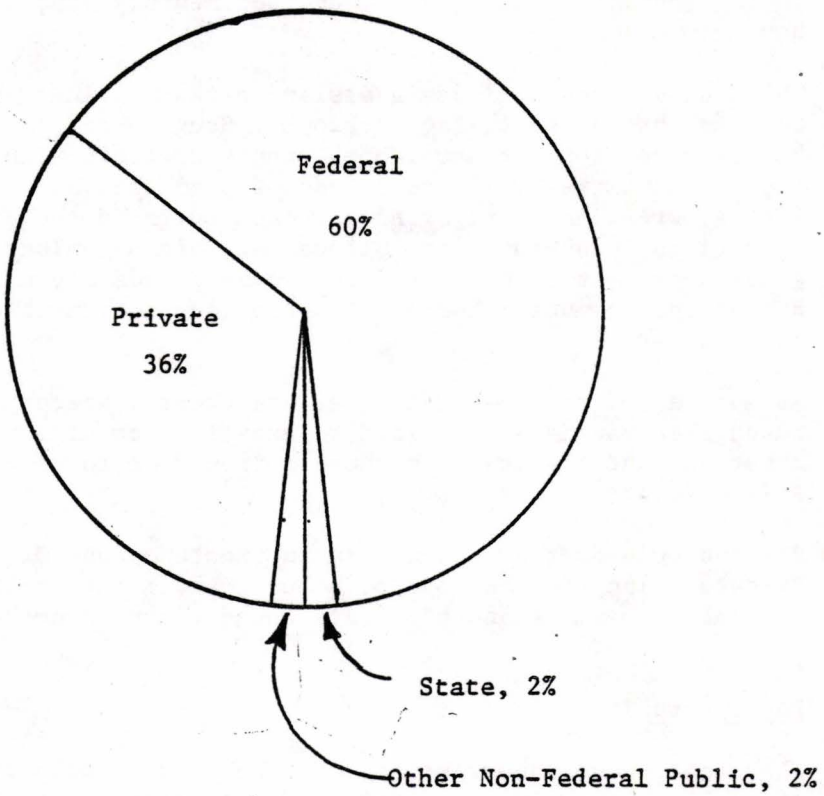
As many as 35 species of grasses are present where ponderosa pine-bunchgrass ranges are in good to excellent condition. Forbs may be numerous, but fluctuate in numbers from year to year depending on soil moisture conditions.

Elk and mule deer are common in the Montane Zone of the Front Range. Predators include the coyote, bobcat, and mountain lion. Many species of smaller mammals and birds are found throughout the area.

Landownership

The Front Range landownership pattern is extremely complex. Thousands of small, privately-owned parcels, intermingled with public lands, were acquired through mining claim patents; others were homesteaded. Cities and counties have acquired lands primarily for recreation and municipal watershed purposes. The State owns scattered parcels throughout the area. U.S. Army, Air Force, and Bureau of Land Management administer small portions of the Front Range. Roughly half of Rocky Mountain National Park lies on the Front Range. National Forests comprise the largest share of the total area.

Ownership of Forested Lands within the Project Area:



II CURRENT SITUATION

Resource Values and Land Uses

Recreation, wildlife, and scenic values are of primary importance on the Colorado Front Range (see Appendix A- "Visual Management Assessment for the Front Range"). The Front Range is situated immediately adjacent to the largest cities in Colorado, and provides the first view of the Rockies for millions of visitors from the East. The Front Range is in full view of Interstate 25, from Wyoming to New Mexico. Some key attractions within and in close proximity to the Front Range include Pikes Peak, Royal Gorge, U.S. Air Force Academy, Mount Evans, Rocky Mountain National Park, and the Rawah Wilderness. The area includes several winter sports sites and numerous resorts, campgrounds, historic places, mountain communities, and other attractions. The Front Range is traversed by Interstate 70, several U.S. highways, a network of State and county highways, and National Forest roads and trails. It is the most heavily used forested area in Colorado.

One of the principal values of the privately-owned lands on the Front Range is development for residences (permanent and recreational) and commercial enterprise. About 40% of the privately-owned Front Range ponderosa pine stands are developed (or in some stage of being developed) and an estimated additional 10% has been platted and approved for development. Land values are extremely high and are escalating.

Watershed values are highly important, and becoming more so as population grows and industrial, agricultural, and other users compete for a limited water supply; water restrictions are now in effect in cities and towns along the Front Range.

Wildlife values associated with many game and non-game species are especially important. Front Range pine forests are prime summer range for a large population of mule deer, and spring and fall range for elk. As subdivision and other human activities increase, big game animals are being forced to use more of the higher elevation pine stands as winter range. Fishing pressure is heavy on the Arkansas, South Platte, and Poudre Rivers and numerous reservoirs, lakes, and small streams.

Domestic livestock grazing is generally of secondary importance in the lodgepole and ponderosa pine stands of the Front Range. Commercial timber harvest is progressing at a relatively low level; trees are of low quality (particularly the ponderosa pine) for lumber production, and there is little demand for roundwood except firewood and house-logs.

Threats to Resource Values and Uses

The mountain pine beetle, one of the most destructive enemies of pine forests, is a natural component of the Front Range. During periods of

low beetle population, they are confined primarily to weakened or decadent trees. As forest stands become crowded, tree vigor declines and the susceptibility of these stands to beetle attack increases.

The mountain pine beetle has been a problem on the Front Range for many years, following generally the pattern of re-establishment and growth of forest stands since the early part of this century. One of the first recorded beetle outbreaks was reported on the San Isabel National Forest in the early 1900's. Between 1908 and 1915, the Forest treated 3,800 infested trees. In 1923, the mountain pine beetle became epidemic on the Roosevelt National Forest, killing an estimated 100,000 trees before being brought under control in 1941. Another lesser outbreak on the Pike National Forest was discovered in 1938; CCC crews brought this one under control in 1940. In the late 1940's another large outbreak occurred on the Roosevelt; by 1954, the beetle had killed 58,000 trees before it was checked and brought under control.

In 1957, aerial observers reported a general increase in mountain pine beetle all along the Front Range. By 1961, the beetle had become epidemic on the Lake George and South Platte Districts of the Pike National Forest. Outbreaks of smaller magnitude were also found throughout the pine type along the Front Range. From 1962-1965, land managers treated more than 109,000 infested trees before bringing the outbreak under control.

The control obtained in 1965 was short-lived and by 1968 suppression was again in progress in localized areas. Bark beetle populations continued to increase and by 1971, the number of infested trees on the Roosevelt National Forest were estimated at 75,000. This increased to 120,000 trees by 1972, and by 1975 there were an estimated 1.5 million infested trees throughout the Front Range. The epidemic appears to be continuing at this level, with evidence that it is moving southward from its present concentration in the central and northern portions of the Front Range.

Already faced with a major pine beetle epidemic, the public and land managers alike are becoming increasingly concerned about the growing threat of catastrophic fire. Notwithstanding continued improvement in fire prevention and control capabilities, many believe the same pattern that led to the pine beetle problem (increasingly dense forest stands), coupled with accelerating use and land development, point to vastly increased potential for disastrous fires to occur on the Front Range.

Several large fires have occurred on the Front Range during the past ten years (see Comforter Mountain Fire photos, 1976 - Appendix B). Although none of these has been catastrophic in terms of area burned, high-value real estate consumed, or lives lost, the question "What about next year, or the year after that?" remains.

Public Concern

Public concern about the Front Range mountain pine beetle epidemic is tremendous, due to the high visibility of dead timber, the impact on recreation and esthetic values, and proximity to population centers. Correspondingly, concern by the Colorado congressional delegation is also very high.

Colorado State Forest Service (CSFS) and the Forest Service - USDA (USFS) are receiving many letters and phone calls about the pine beetle epidemic. Most notable among the concerns expressed are:

- Shock and disbelief at the number of trees being destroyed
- Impact on the beauty of the Front Range
- Threat of catastrophic fire
- Deterioration of property values
- Federal programs too little, too late

CSFS has sponsored or participated in approximately 250 public meetings related to the problem in the past year, with USFS personnel participating in many of these as well. About 50 press releases have been issued, and numerous radio and television programs have focused on the Front Range beetle situation. Specific examples of recent I&E efforts aimed at the mountain pine beetle epidemic include:

- Production by CSFS of a 15-minute color film, "The Silent Killer" about the beetle, its life history, its destruction, and methods of control
- A 5-part feature series by KOA-TV, Denver, based on the above film, and including interviews with agency personnel, landowners, etc.
- Several hand-out publications describing the problem and what needs to be done

Both CSFS and USFS have received a considerable number of letters, as well as personal and telephone contacts, by U.S. Senators and Representatives, and State and local officials. Samples of press clippings and letters illustrating public concern about the mountain pine beetle epidemic are included in Appendix A, along with photos and publications relevant to this issue.

Intense public and political reaction to the Front Range fire situation probably will not come to the fore until after a really serious fire has occurred - as has been the case with the beetle epidemic.

Management Needs

The two basic alternatives for managing the Front Range forests are:

- Let nature take its course, and accept the results
- Apply available knowledge to manage stands of trees, to maintain and protect resource values for man's needs

The current public outcry over the mountain pine beetle epidemic and growing concern about fire potential make it clear that the first alternative is not acceptable.

The primary vegetation management need on the Front Range is to create conditions that will prevent mountain pine beetle epidemics. The best way to accomplish this is through silvicultural control or "getting stands under management." The rationale behind this approach is to change stands that are in "susceptible condition" to stands that are resistant to insects and disease. This can be accomplished by thinning or harvest so that only a prescribed number of properly spaced trees with an appropriate distribution of age classes remain.

Along with pine beetle prevention through stand density reduction, a program of direct control of the beetle epidemic is needed. This is accomplished by cutting and chemically treating or burning infested trees to kill the insects and prevent their spread to adjacent trees and stands. Such an effort will help to keep insect numbers from multiplying in areas where they are concentrated, and to reduce further losses while the silvicultural program is underway.

An extensive silvicultural control program to prevent pine beetle will also reduce the threat of fire. With fewer trees per acre, less fuel will be available to support "blow-up" fire conditions, and control chances will be greatly improved. Treatment is needed to reduce fuel concentrations in areas thinned or harvested, and areas where pine beetles have killed large numbers of trees.

Specific treatment is needed to re-establish browse and legumes for wildlife where dense pine stands have suppressed and crowded out these species. Cover of the right kind and in proportion with food supply is needed for birds and small animals. Snags used by wildlife must be protected.

Current Vegetation Management Efforts

Management efforts to control the mountain pine beetle epidemic have been largely confined to a program of direct control. Such a program has been underway for several years, mostly on privately-owned lands where economic values are highest. Direct control has met with considerable success in localized areas, but it is expensive ($3-10/tree or higher) and when used alone the residual stand remains susceptible to attack.

Colorado State Forest Service has initiated a unique and effective approach to the problem based on a "designated control area" (DCA) concept. A DCA is a land unit with mountain pine beetle population levels sufficient to seriously threaten resource values and for which the associated local economic, biological, and sociological factors indicate feasibility of suppression. A DCA's boundaries are established along natural barriers (i.e. ridge tops and timber types), isolating the designated area as best as possible from beetle in-flight from surrounding areas. A minimum of 80% of the landowners within the area (public as well as private) must commit themselves to participation before a DCA is established. Fifty DCA's now exist in the central and northern portions of the Front Range, which include approximately 185,000 acres. Initial action focuses on direct control treatment within the DCA, ideally to be followed by stand treatment to provide a well-spaced stand of trees that will be resistant to future attack. This organization/operation concept provides an excellent framework that can be expanded and used throughout the Front Range.

Thinning and harvest have been accomplished at a relatively low level on both private and public lands. Increased emphasis is being given to harvest for firewood and houselogs, and this activity, along with individuals gathering firewood for their own use, is expected to increase.

Fuel management to reduce fire hazard and for other benefits is receiving strong emphasis on National Forest land. The Rocky Mountain Region's projected funding increases for this purpose are programmed entirely for the Front Range and the Black Hills areas.

Very little has been accomplished to date in wildlife habitat improvement on the Front Range.

III VEGETATION MANAGEMENT PROPOSAL

Goal, Objectives, and Approach

The goal is to achieve a managed, attractive forest on the Colorado Front Range.

To reach this goal, objectives have been established — to be achieved within five years — to:

- Stop the current mountain pine beetle epidemic
- Create stand conditions which will enable prevention of future mountain pine beetle epidemics
- Accomplish fuel treatment in all stands where preventive treatment for mountain pine beetle is applied
- Modify stand treatments to create (or maintain) stand diversity for wildlife habitat, apply specific treatments for wildlife habitat improvement, and protect snags needed for wildlife in all treated areas
- Maintain the scenic quality of the area treated

Management action to meet the objectives will be carried out on State, private, other non-federal public, and National Forest lands. The proposal has been developed as a total team effort by the Colorado State Forest Service and the Rocky Mountain Region, Forest Service-USDA.

The proposal identifies supplemental federal funding needed, along with additional State, local jurisdiction, and private capital (or landowner labor and equipment) to accomplish the objectives - beyond that which can be accomplished with current and projected levels of 'regular' funding through the five-year period.

It should be emphasized that this is a budgetary proposal only. It is not a land management proposal. Land management objectives and site specific plans will determine actual treatments for land units and forest stands.

The Regional Forester and State Forester are in total agreement that the problems on the Front Range will receive top priority in Colorado in utilizing National Youth Conservation Corps and similar manpower programs as they become available. Work accomplished by this means will proportionately reduce the supplemental funding requests.

This proposal has been discussed with Bureau of Land Management (BLM) and it very closely ties with a similar proposal, now in review, for treatment on their lands. The BLM proposal includes thinning (1,800 acres), fuel treatment (1,500 acres), and direct control of mountain pine beetle (4,210 trees) over a three-year period. The mountain pine beetle problem also extends into the Rocky Mountain National Park. National Park Service is cooperating with adjacent landowners by treating infested trees along selected portions of the eastern border of the Park, but there are no plans for stand treatment within the Park.

Research findings by Rocky Mountain Forest and Range Experiment Station have been used extensively in developing the proposal; their publication "Multi-purpose Silviculture in Ponderosa Pine Stands of the Montane Zone of Central Colorado" (Myers, 1974) was found to be especially helpful. As detailed land management and project planning progresses on the Front Range, Research will be closely consulted. The Station advises that execution of the proposed management practices will provide an excellent, broad-scale base upon which to validate and refine research data in the ponderosa and lodgepole pine types.

Overview of Proposed Treatment

Primary treatment proposed within the threatened area consists of reducing stand density and a combination of methods of fuel treatment. Various modifications will be applied in the above treatments for wildlife and scenic purposes. Additional treatment for improvement of the wildlife food and cover ratio is also included.

Treatment will be applied in ponderosa and lodgepole pine stands, where the mountain pine beetle and potential catastrophic fire threats are concentrated on the Front Range. The project area breaks down as follows:

Gross area	1,334,600 acres
Beetle-killed, beyond treatment	61,300 acres
Currently under management	72,900 acres
Natural stand condition OK (not susceptible to beetle epidemic)	615,100 acres
Threatened area	585,300 acres

Vegetation treatment (including regular and supplemental programs) is planned on about 60% of the total threatened area, including 88% of the threatened National Forest lands and 28% of the threatened State, private, and other non-federal public lands. National Forest lands not planned for treatment are those too steep and/or inaccessible to be practical for treatment. The more limited treatment on State, private, and non-federal public lands is due to the same reasons noted above for National Forest lands, plus additional factors: (1) some landowners will not be willing to treat their lands - particularly where no immediate economic gain will be realized, and (2) many landowners, although otherwise willing, will be unable to provide the needed funding (or labor and equipment).

Proposed treatments and costs are described below, along with supporting activities and funds needed to assure accomplishment of the full range of multiple use benefits in this project. Established cost share rates for Forest Service-USDA cooperative programs were used in cost estimates for all proposed treatments.

Thinning

Reduction of stand density by thinning is the largest single component of this proposal. Thinning is planned on 267,200 acres, as follows:

State lands	4,600 acres
Private lands	40,500 acres
Local government lands	3,900 acres
National Forest lands	218,200 acres

A key consideration is that 185,600 acres of thinning is proposed within mature stands. For reasons explained previously (primarily, low value of trees for sawtimber and limited demand for roundwood), it is not possible to accomplish more than a small portion of the needed treatment of mature stands through commercial harvest. Thinning in these stands will be directed toward selective reduction of stand density by removing decadent, damaged, and least vigorous trees.

Actual spacing will be determined on a site-specific basis in line with wildlife, esthetic, and other requirements. Total estimated cost for thinning is $19,412,000, at an average cost of $70 per acre, plus Cooperative Forest Management (USFS) funds (matched by State) to provide multiple use planning and technical assistance on privately-owned lands. Forestry Incentives Program funding reflects estimated total qualifying acreage; Agricultural Conservation Program funding reflects limited availability due to competition for these funds with agricultural practices.

Sources of funds to accomplish the proposed thinning are shown below:

Source of Funds	Ownership/Funds Needed				
	State	Private	Local Govt.	National Forests	TOTAL
	- - - -	- - (thousand dollars) - - -			- - - -
State	200	1,055			1,255
Private		901			901
Local Government			170		170
*Cooperative Forest Management (CFM)		354			354
*Forestry Incentives Program (FIP)		268			268
*Agricultural Conservation Program (ACP)		48			48
*Insect & Disease Control (I&DC)	122	917	103		1,142
**Timber Stand Improvement (033)				15,274	15,274
TOTAL	322	3,543	273	15,274	19,412

*Forest Service-USDA, State & Private Forestry (FIP & ACP are allocated funds)

**Forest Service-USDA, National Forest System

It is estimated that 7,500 acres of thinning, in addition to the above, will be accomplished on the Front Range during the next five years with regular funding.

Harvest

Reduction of stand density through commercial timber sales is planned on 55,000 acres, as follows:

State lands 1,600 acres

Private lands	26,600 acres
Local government lands	1,500 acres
National Forests	25,300 acres

Harvest objectives will be to enhance scenic values, improve wildlife habitat, and provide better recreation opportunities, and wood will be a by-product. Harvest methods will depend upon individual stand conditions and site specific land management considerations.

Most of the accelerated harvest activity will be accomplished through sales of green timber for firewood. A small increase in commercial sales for sawtimber, posts, and poles is projected during the five-year project period.

No road construction funds are requested. Timber sales will be offered only where roads are in place or can be constructed (or reconstructed) with available funds.

Total estimated cost for commercial harvest is $2,332,000, at an average of approximately $42 per acre. Cooperative Forest Management (CFM) funding includes provision for multiple use planning, as well as technical harvest assistance on privately-owned lands. Sources of funds to accomplish the proposed harvest are shown below:

	Ownership/Funds Needed				
Source of Funding	State	Private	Local Govt.	National Forests	TOTAL
	(thousand dollars)				
State	51	623			674
Local Government			47		47
*Cooperative Forest Management (CFM)		623			623
*Insect & Disease Control (I&DC)	31		29		60
**Commercial Sales (031)				928	928
TOTAL	82	1,246	76	928	2,332

*Forest Service-USDA, State & Private Forestry
**Forest Service-USDA, National Forest System

It is estimated that an additional 11,200 acres will be harvested on the Front Range during the next five years through regular programs.

Direct Control of Mountain Pine Beetle

An accelerated program of direct control of mountain pine beetle, in combination with thinning and harvest to reduce stand density, comprise the planned effort to stop the current beetle epidemic and prevent future epidemics.

Treatment will consist of cutting and chemically treating infected trees with either ethylene dibromide (EDB) or Lindane.

Treatment of 957,000 trees is planned, as follows:

Private lands	387,700 trees
Local government lands	6,600 trees
National Forest lands	562,700 trees

It is projected that needed direct control on State lands will be accomplished with funding currently planned for the five-year period.

Total supplemental cost for direct control is estimated at $6,964,000, at an average cost of $7.28 per tree. Sources of funding for direct control are shown below:

Source of Funding	Ownership/Funds Needed				
	State	Private	Local Govt.	National Forests	TOTAL
	- - - - -	- - - (thousand dollars) - - -			- - -
State		1,023	17		1,040
Private		1,182			1,182
Local Government			20		20
*Insect & Disease Control (I&DC)		1,323	23	3,376	4,722
TOTAL	-	3,528	60	3,376	6,964

*Forest Service-USDA, State and Private Forestry

Current plans are for treatment of approximately 360,000 trees, in addition to the above, during the five-year project period.

Fuel Treatment

Treatment of fuels includes the accumulated backlog (from previous harvest, thinning, and mountain pine beetle epidemic) in the project area, plus that required by the proposed stand density reduction treatment.

The estimated combination of types and area of fuel treatment is shown below:

Ownership	Hand-Pile & Burn, or Chip	Machine Chop	Prescribed Burn	Machine Pile & Burn	Fuel Breaks	Snag Felling
			(acres)			
State	800	2,900	200	100	500	2,000
Private	12,200	2,900	1,500	100	900	11,100
Local Govt.	700	200	300		200	2,500
Nat'l Forests	23,900	4,500	10,800	19,500	11,400	62,900
TOTAL	37,600	7,600	12,800	19,700	13,000	78,500

The above treatments will be used within the areas to be harvested or thinned, except: (1) snag felling will be done on an estimated 10% of private and 50% of public lands covered by mature ponderosa pine stands not planned for other treatment, and (2) fuel breaks will extend across both treated and untreated stands. Lopping and scattering slash is included as part of the thinning and commercial harvest operations.

Total supplemental cost for fuel treatment is estimated at $13,318,000, exclusive of lopping and scattering slash. Sources of funding for fuel treatment are shown below:

Sources of Funding	Ownership/Funds Needed				
	State	Private	Local Govt.	National Forests	TOTAL
	(thousand dollars)				
State	139				139
Private		1,493			1,493
Local Government			113		113
*Cooperative Fire Protection (CM-2)	138	1,492	113		1,743
**Fire Pre-Suppression (115)				9,830	9,830
TOTAL	227	2,985	226	9,830	13,318

*Forest Service-USDA, State & Private Forestry

**Forest Service-USDA, National Forest System

Wildlife Habitat Improvement

Vegetation management for wildlife needs is included in this proposal, in two basic categories: (1) modification of the thinning, harvest, and fuel treatment specifications as needed, and (2) additional specific treatments to improve wildlife habitat.

Creation of wildlife openings (2-5 acres in immature stands, 5-10 acres in mature stands), on about 5% of the total treated area, will be accomplished by modifying the thinning and harvest treatments. Since this will be offset by lighter cuts to achieve proper diversity in other stands, no additional costs are included for creating openings. Browse and legume species for wildlife will be planted within the openings.

It is planned to hand-build brush piles (average two per acre) to improve cover for small mammals and birds on about 25% of the area to be thinned and harvested. Additional work of this kind will be accomplished where fuel treatment work calls for brush piling, by leaving selected piles unburned.

Identifying and signing snags to be saved for special wildlife needs will be needed on all areas to be thinned and harvested, plus those mature ponderosa pine stands where snag felling is planned.

Proposed wildlife habitat improvement work is shown below:

Ownership	Plant Wildlife Openings	Build Wildlife Brush Piles	Identify & Sign Wildlife Snags
		(acres)	
State	300	1,600	7,000
Private	3,400	17,000	70,000
Local Government	300	1,400	6,000
National Forests	13,000	65,000	260,000
TOTAL	17,000	85,000	343,000

Total estimated funding for wildlife habitat improvement is $1,830,000. Sources of funding for wildlife habitat improvement are shown in the following table:

Source of Funding	Ownership/Funds Needed				
	State	Private	Local Govt.	National Forests	TOTAL
	----	---(thousand dollars)		----	---
State	37				37
Private		93			93
Local Government			32		32
*Agricultural Conservation Program (ACP)		279			279
**Wildlife Habitat Improvement (080)				1,389	1,389
TOTAL	37	372	32	1,389	1,830

*Forest Service-USDA, State & Private Forestry (allocated funds)

**Forest Service-USDA, National Forest System

Supporting Activities

This section describes activities needed in support of the vegetation and fuel management work outlined above, to assure coordination and accomplishment of multiple benefits:

- Soils and watershed analyses will be conducted on areas where treatment is planned, and specific management recommendations will be developed for protection of soils and watershed values. Cost estimates were based on 1.2% of fuel treatment costs, 2.5% of commercial harvest costs, and 0.5% of thinning costs. Total estimated soil and water support costs are $315,000.

- To assist in determining specific stand treatment needed, a modified Stage II inventory will be done on proposed thinning and harvest areas. Cost estimate is based on $2.50/acre. Total estimated Stage II inventory costs are estimated at $806,000.

- Visual management inventory and mapping will be completed on the total project area as a basis for developing landscape management recommendations. Cost estimate is based on $.10/acre. Total visual management support costs are estimated at $133,000.

- Cultural resource inventory will be required on those areas where soil disturbance or burning is involved, providing a basis for modification of planned treatment as needed to protect cultural values. Cost estimate is based on $1.70/acre. Total cultural resource support costs are estimated at $162,000.

- To provide for detailed planning and coordination of fuel treatment, fuels management needs inventory and mapping will be completed for the project area. Cost estimate is based on $.15/acre. Total fuels management support costs are estimated at $200,000.

- Forest products utilization and marketing technical assistance will be provided to forest products manufacturers and dealers to assist in maximizing utilization of wood fiber from the areas treated. Cost estimate is based on the equivalent of one full-time FPU specialist assigned to this project for its duration, at a cost of $200,000.

- To provide for wildlife needs and coordination in implementing the planned treatment, a wildlife habitat prescription and specific management recommendations will be developed for the total treated area. Cost estimate is based on $.50/acre. Total wildlife support costs are estimated at $171,000.

Support costs for State, private, and local government lands are shown as financed by General Forestry Assistance (GFA) funds on a federal/state match of 80:20. All forest products utilization and marketing costs are included under GFA, with 20% State match. National Forest System support costs have been assigned to the benefiting Protection and Management (P&M) functions.

Total support costs are estimated at $1,987,000. Sources of funds for supporting activities are shown in the following table:

Source of Funding	Ownership/Funds Needed		
	State, Private, & Local Govt.	National Forests	TOTAL
	(thousand dollars)		
State	146		146
*General Forestry Assistance (GFA)	583		583
**Stage II Inventory (037)		609	609
**Recreation Management (070)		182	182
**Wildlife Habitat Management (080)		129	129
**Watershed Management (091)		218	218
**Fire Pre-Suppression (115)		120	120
TOTAL	729	1,258	1,987

*Forest Service-USDA, State and Private Forestry

**Forest Service-USDA, National Forest System

Stand data and cost summary are shown on the following Tables, A and B.

TABLE A
PONDEROSA AND LODGEPOLE PINE STANDS
COLORADO FRONT RANGE

Size Class/Ownership	Acres (Thousands) Gross Area	MPB 3/ Infested	Under Management	Natural 4/ Stand OK	Area Threatened
9.0" DBH & Over 1/					
Pike/San Isabel NF 2/	288.7	2.9	26.1	73.9	185.8
Arapaho/Roosevelt NF	202.3	21.4	13.4	116.2	51.3
(Sub-Total), NF	(491.0)	(24.3)	(39.5)	(190.1)	(237.1)
State	5.0	.3	1.2	.3	3.1
Private	152.3	7.5	3.2	42.4	99.3
Non-Federal Public	5.5	.7	.4	.5	3.9
(Sub-Total), S&P	(162.8)	(8.5)	(4.8)	(43.2)	(106.3)
TOTAL - 9" DBH & Over	653.8	32.8	44.3	233.3	343.4
5.0 - 9.0" DBH					
Pike/San Isabel NF	84.0	0	2.7	60.6	20.7
Arapaho/Roosevelt NF	184.2	15.7	10.2	124.8	33.6
(Sub-Total), NF	(268.2)	(15.7)	(12.9)	(185.4)	(54.3)
State	19.7	.9	1.8	3.5	13.4
Private	303.4	10.3	9.1	135.4	148.7
Non-Federal Public	18.2	1.3	1.1	5.5	10.3
(Sub-Total), S&P	(341.3)	(12.5)	(12.0)	(144.4)	(172.4)
TOTAL - 5.0 - 9.0" DBH	609.6	28.2	24.9	329.8	226.7
Less Than 5.0" DBH					
Pike/San Isabel NF	8.9	0	.5	6.4	2.0
Arapaho/Roosevelt NF	26.0	0	.8	25.2	.1
(Sub-Total), NF	(34.9)	(0)	(1.3)	(31.6)	(2.1)
State	2.9	0	.1	1.3	1.4
Private	29.3	.2	2.1	16.7	10.3
Non-Federal Public	4.1	.1	.2	2.4	1.4
(Sub-Total), S&P	(36.3)	(.3)	(2.4)	(20.4)	(13.1)
TOTAL - Less Than 5.0" DBH	71.2	.3	3.7	52.0	15.2
TOTAL	1,334.6	61.3	72.9	615.1	585.3

1/ Non-NF data based on size classes 11.0" and larger, 5.0 - 10.9", and less than 5.0"

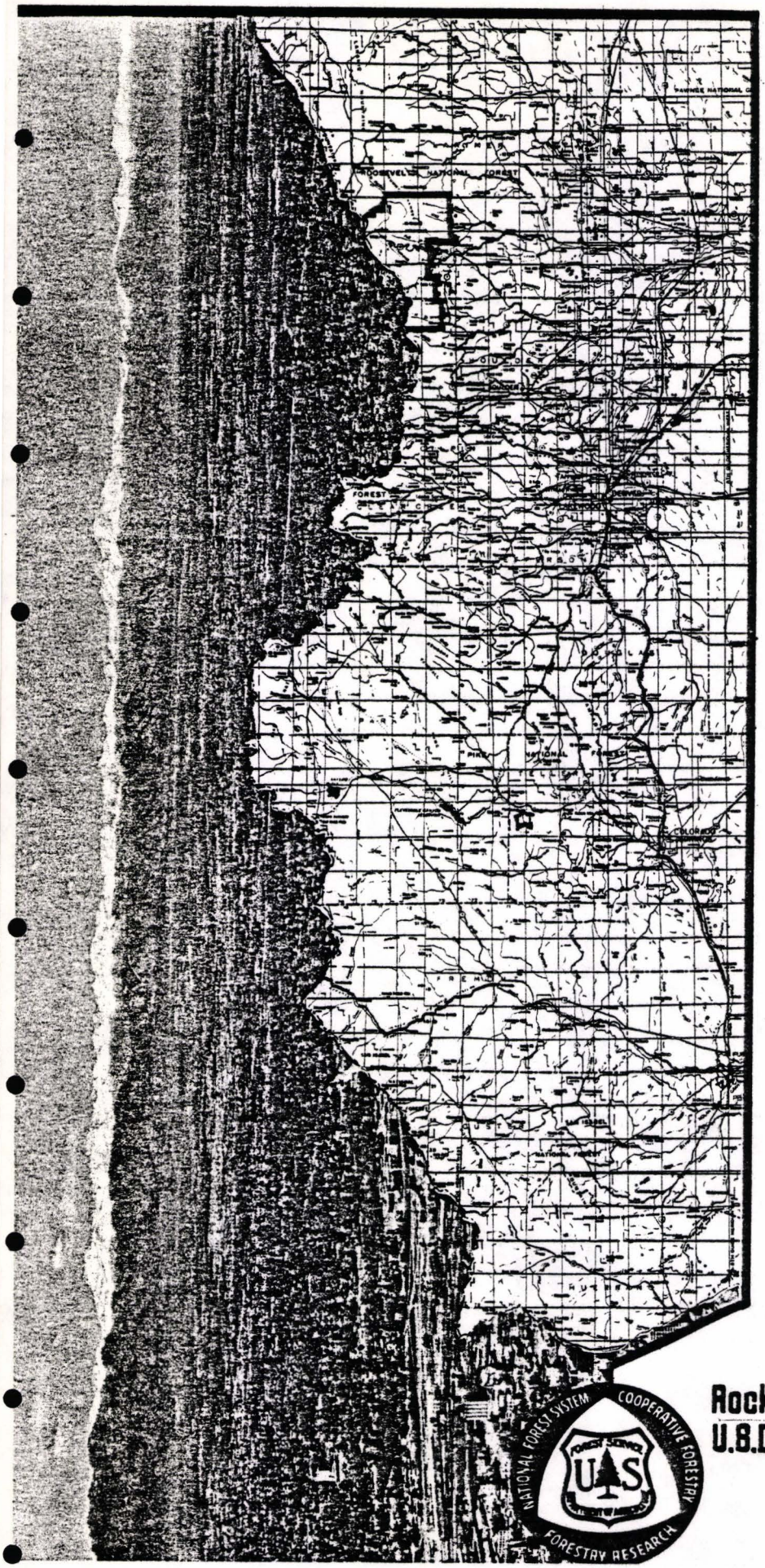
2/ NF data excludes wilderness and roadless areas.

3/ Stands killed or dying due to pine beetle epidemic; beyond treatment.

4/ Not susceptible to mountain pine beetle epidemic.

TABLE B
TREATMENT/COST SUMMARY
(Supplemental Program)

Treatment/ Ownership	Unit/ No.	Funding Source (M $)					Total $ (M)
		Non-Federal			Federal		
		Private	State	Local Agency	S&PF	NFS	
Thinning	(M ac.)						
State	4.6		200		122		322
Private	40.5	901	1,055		1,587		3,543
Non-Fed. Publ.	3.9			170	103		273
Nat'l Forests	218.2					15,274	15,274
(Sub-Total)	(267.2)	(901)	(1,255)	(170)	(1,812)	(15,274)	(19,412)
Harvest	(M ac.)						
State	1.6		51		31		82
Private	26.6		623		623		1,246
Non-Fed. Publ.	1.5			47	29		76
Nat'l Forests	25.3					928	928
(Sub-Total)	(55.0)	(-)	(674)	(47)	(683)	(928)	(2,332)
Dir. Control-MPB	(M trees)						
State	-						
Private	387.7	1,182	1,023		1,323		3,528
Non-Fed. Publ.	6.6		17	20	23		60
Nat'l Forests	562.7				3,376		3,376
(Sub-Total)	(957.0)	(1,182)	(1,040)	(20)	(4,722)	(-)	(6,964)
Fuel Treatment	(M ac.)						
State	3.6		139		138		277
Private	28.7	1,493			1,492		2,985
Non-Fed. Publ.	3.9			113	113		226
Nat'l Forests	133.0					9,830	9,830
(Sub-Total)	(169.2)	(1,493)	(139)	(113)	(1,743)	(9,830)	(13,318)
Wildl. Habitat	(M ac.)						
State	8.9		37				37
Private	90.3	93			279		372
Non-Fed. Publ.	7.7			32			32
Nat'l Forests	336.5					1,389	1,389
(Sub-Total)	(443.4)	(93)	(37)	(32)	(279)	(1,389)	(1,830)
Support Costs							
(Sub-Total)	(-)	(-)	(146)	(-)	(583)	(1,258)	(1,987)
TOTAL	-	3,669	3,291	382	9,322	28,679	45,843



APPENDIX (C)

Photos, Letters, Press Clippings and Publications

Colorado Front Range Vegetation Management Proposal

Rocky Mountain Region
U.S.D.A. Forest Service

Colorado State Forest Service

COLORADO STATE FOREST SERVICE

APPENDIX A

PHOTOS, LETTERS,
PRESS CLIPPINGS AND
PUBLICATIONS

COLORADO
FRONT RANGE
VEGETATION MANAGEMENT
PROPOSAL

April, 1977

CONTENTS

This appendix includes sample letters and press clippings illustrating the public concern that exists about the mountain pine beetle epidemic on the Colorado Front Range. Also included are photos illustrating the beetle problem and a recent major fire within the beetle-infested area. Publications are enclosed that have been developed in response to the beetle epidemic.

LETTERS	(yellow pages)
PRESS CLIPPINGS	(white pages)
PHOTOS, PUBLICATIONS	(packet)

Dean RAWSON INC.

OCT 10 19??

October 7, 1975

To: Senator Floyd Haskell

Dear Senator Haskell,

I am a property owner in Teller County, Colorado, specifically in Ridgewood which lies between Woodland Park and Deckers just east of State Route 67.

I am writing to bring to your attention a matter of grave concern to all of the residents in this area, and quiteprobably within the entire state. Our states pine trees are becoming infested with, and systematically destroyed by, the pine bark beetle. The area west of Fort Collins is already a disaster area and the devastation is rapidly spreading. A federal program is in being to help slow and eventually eliminate the infestation. However, it appears that the effort will be too little too late unless additional funds and federal effort are immediately forthcoming.

You may fairly ask, what are the property owners doing about it? We have formed a local action team within our area, raised funds and are actively doing as much spraying as possible. Our task is, in a word, formidable. Particularly since we are surrounded effectively by the Pike National Forest. The Forest Service in our area is doing what they can with limited manpower and funds.

We, the residents of Ridgewood, call on you to provideactive support to save the trees and the beauty of Colorado. The area needs aid, both in funds and manpower. We expect your positive support and action.

Sincerely,

Dean C. Rawson

Dean Rawson
DR/dm

3833 NORTH 72nd STREET OMAHA NEBRASKA 68134 TELEPHONE (402) 572-60??

TIMOTHY E. WIRTH
2ND DISTRICT, COLORADO
COMMITTEES:
INTERSTATE AND FOREIGN COMMERCE
SCIENCE AND TECHNOLOGY

Congress of the United States
House of Representatives
Washington, D.C. 20515

WASHINGTON OFFICE:
516 CANNON HOUSE OFFICE BUILDING
WASHINGTON, D.C. 20515
(202) 225-2161
DISTRICT OFFICE:
9485 WEST COLFAX AVENUE
LAKEWOOD, COLORADO 80215
(303) 234-5200

December 4, 1975

Mr. John R. McGuire, Chief
U. S. Forest Service
Department of Agriculture
Washington, D.C. 20250

Dear John:

As you may be aware, National Forests and other woodlands in the foothills west of Denver are significantly infested by the pine bark beetle. I understand that citizens of the area are volunteering their time and effort in a campaign to eradicate the beetle.

Could you please advise me concerning: (1) the scope of the beetle infestation; (2) what action the Forest Service has taken to combat the problem, both by assisting the volunteer effort and on its own; (3) the effectiveness of any such Forest Service action; and (4) whether further action is needed to minimize the destruction.

I thank you for your prompt attention to this matter.

With best wishes,

Sincerely yours,

Tim Wirth

Timothy E. Wirth

TEW:q

THIS STATIONERY PRINTED ON PAPER MADE WITH RECYCLED FIBERS

2D DISTRICT, COLORADO

COMMITTEES:
INTERSTATE AND FOREIGN COMMERCE
SCIENCE AND TECHNOLOGY

Congress of the United States

House of Representatives

Washington, D.C. 20515

WASHINGTON, D.C. 20515
(202) 225-2161

DISTRICT OFFICE:
9485 WEST COLFAX AVENUE
LAKEWOOD, COLORADO 80215
(303) 234-5200

July 26, 1976

Chief John McGuire
U. S. Forest Service
U. S. Department of Agriculture
Washington, D. C. 20250

Dear Mr. McGuire:

Thank you for your letter of July 9 regarding the Colorado Front Range mountain pine beetle suppression projects. I am pleased to learn that transition quarter funds for the Colorado cooperative project and the Roosevelt National Forest treatment program have been allocated and approved.

However, after examining the proposed Forest Insect and Disease Management Program and Project Selection Criteria, July 1976, I am very concerned. By failing to take into account the problems unique to mountain residential areas such as Colorado's Northern Front Range and parts of Southern California, the U. S. Forest Service may be adopting very shortsighted criteria. I strongly urge that you give increased consideration for such public values as fire prevention, flood control, recreational and aesthetic value, and property value maintenance.

Both Jefferson and Boulder Counties include a large percentage of higher elevation foothill areas where private residential land is interspersed with Federal and state lands. A particular attraction in these residential areas is the large stands of ponderosa pine which are currently infected to the epidemic level by the mountain pine bark beetle. On a recent tour, I inspected some of the areas destroyed by the current epidemic and talked with many residents who are working with the control projects to minimize the effects of beetle kill on their lands and nearby Roosevelt Forest Service lands. Their concern, which I also share, is that if the funding ceases due to altered priorities, the entire front range is in danger of being ravaged and recent work and money spent would have been wasted. I would hope that you will carefully reconsider the proposed Project Selection Criteria so that the value of these past efforts will not be lost.

THIS STATIONERY PRINTED ON PAPER MADE WITH RECYCLED FIBERS

If I can be of any assistance, please do not hesitate to contact me.

I look forward to your early response.

Sincerely yours,

Timothy E. Wirth

TEW:jla

Tim Wirth

518 Cannon Office Building, Washington, D.C. 225-2161 • 9485 West Colfax Avenue, Lakewood, Colorado 234-5200

FOR IMMEDIATE RELEASE: Monday, July 26, 1976
CONTACT: Craig Liske
234-5200

WIRTH CONDEMNS U.S. FOREST SERVICE GUIDELINES

LAKEWOOD: Representative Tim Wirth (D. Colo) today condemned proposed U.S. Forest Service guidelines on Forest Insect and Disease Management, calling them "shortsighted" and "stacked in favor of the timber industry." Following a tour of pine beetle infested areas in Boulder County, Wirth released a copy of a letter he is sending to U.S. Forest Service Chief John R. McGuire criticizing proposed guidelines for selecting treatment areas.

Wirth's letter urges "increased consideration for such public values as fire prevention, flood control, recreational and esthetic value, and property value maintenance."

"I strongly question current Forest Service guidelines which ignore the unique problems of the mountain residential areas of Colorado's front range, including Boulder and Jefferson Counties," Wirth said. "The way it stands now, if the timber industry can't make money cutting these trees, the Forest Service seems prepared to wait until they burn down."

FS R-2
RECEIVED
AUG 4 1976
REGIONAL FORESTER

Wirth explained that he received assurance earlier of continued funding of the control program thru September 30, 1976. However, funds for fiscal 1977 are currently undergoing reevaluation in which treatment of private lands without commercial timber value is in danger of being deemphasized. The funds are administered by the Colorado State Forest Service with the cooperation of area residents who have formed beetle control districts.

Wirth was accompanied on the Saturday tour by Dave Sonnen of the State Forest Service office, and Maggie Markey, Boulder County Commissioner. Wirth talked with residents of the Sugarloaf Beetle Control District, and heard how they had treated ten thousand infected trees from March to July of this year. Wirth was told that one infected tree is capable of infecting three to five other trees.

"These programs have had great success and impressive local support," Wirth said. "Cutting off funds now would be an irreversible mistake."

-30-

July 26, 1976

Chief John McGuire
U.S. Forest Service
U.S. Department of Agriculture
Washington, D.C. 20250

Dear Mr. McGuire:

Thank you for your letter of July 9 regarding the Colorado Front Range mountain pine beetle suppression projects. I am pleased to learn that transition quarter funds for the Colorado cooperative project and the Roosevelt National Forest treatment program have been allocated and approved.

However, after examining the proposed Forest Insect and Disease Management Program and Project Selection Criteria, July 1976, I am very concerned. By failing to take into account the problems unique to mountain residential areas such as Colorado's Northern Front Range and parts of Southern California, the U.S. Forest Service may be adopting very shortsighted criteria. I strongly urge that you give increased consideration for such public values as fire prevention, flood control, recreational and aesthetic value, and property value maintenance.

Both Jefferson and Boulder Counties include a large percentage of higher elevation foothill areas where private residential land is interspersed with Federal and state lands. A particular attraction in these residential areas is the large stands of ponderosa pine which are currently infected to the epidemic level by the mountain pine bark beetle. On a recent tour, I inspected some of the areas destroyed by the current epidemic and talked with many residents who are working with the control projects to minimize the effects of beetle kill on their lands and nearby Roosevelt Forest Service lands. Their concern, which I also share, is that if the funding ceases due to altered priorities, the entire front range is in danger of being ravaged and recent work and money spent would have been wasted. I would hope that you will carefully reconsider the proposed Project Selection Criteria so that the value of these past efforts will not be lost.

If I can be of any assistance, please do not hesitate to contact me. I look forward to your early response.

Sincerely yours,

Timothy E. Wirth

TEW:jl

PATRICIA SCHROEDER
1ST DISTRICT, DENVER, COLORADO

DISTRICT OFFICE:
DENVER FEDERAL BUILDING
1767 HIGH STREET
DENVER, COLORADO 80218
(303) 837-2154

WASHINGTON OFFICE:
1131 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, D.C. 20515
(202) 225-4431

ARMED SERVICES COMMITTEE
POST OFFICE AND CIVIL SERVICE COMMITTEE

Congress of the United States

House of Representatives

Washington, D.C. 20515

September 3, 1976

Robert Averall
State and Private Forestry(SIDM)
PO box 25127
Denver, CO 80225

Dear Mr. Averall:

My Denver District Office has received the enclosed letter concerning the destruction of pine trees in Colorado forests by disease.

I would appreciate your commenting on Ms. Berkens' letter. Also, I would be interested in knowing whether federal funds could be used to help alleviate the problem.

Please respond to my Denver District Office returning the enclosed correspondence.

With kind regards.

Sincerely,

Patricia Schroeder
Member of Congress

PS:mrm
Encl.

USDA-Forest Service, R-2
RECEIVED
SEP 8 '76
Forest Insect & Disease Management, S&PF

R2-FIDM - Station
IF
CT

THIS STATIONERY PRINTED ON PAPER MADE WITH RECYCLED FIBERS

Ruth Berkens
165 So. Cherokee St.
Denver, Colo. 80223

August 24, 1976

U. S. Representative Patricia Schroeder
1767 High Street
Denver, Colorado

Dear Representative Schroeder:

I recently took a ride from Denver to the mountains and Gross Dam situated in Boulder County.

I was shocked and saddened to see how many thousands of lovely old pine trees have been destroyed by disease and apparently nothing is being done to stop this and clear out these dead trees and prevent the disease from spreading to live, healthy trees.

These trees are so important to prevent wind and water errosion, I belive an effort should be made to save as many trees as possible and also new trees be planted where diseased trees are removed. Unless something is done very soon, many more thousands of trees will be destroyed.

Regardless of which County these trees are in or who owns the land, it is still in the State of Colorado and funds should be allocated to save our forests.

Yours truly,

Ruth Berkens

Ruth Berkens

5200

September 16, 1976

Honorable Patricia Schroeder
Denver Federal Building
1767 High Street
Denver, Colorado 80218

Dear Mrs. Schroeder:

We have read Mrs. Berkens' letter transmitted with your September 3, 1976, letter and have the following comments.

It is the mountain pine beetle which is killing large numbers of pine trees in the Colorado Front Range. This beetle is a natural component of ponderosa and lodgepole pine forests. Numerous attempts have been made to control outbreaks of the beetle. The earliest recorded effort dates back to 1908. Temporary suppression of the beetle has resulted from some of these efforts. However, the population has always returned to high levels within a few years.

When forests are healthy, the insect is confined primarily to individual or groups of decadent, severely damaged, or weakened trees. As forests become older or crowded, tree vigor declines and susceptibility to bark beetle attack increases. Diseases and periods of drought also have a detrimental effect, and make the trees more susceptible to attack.

Human factors which affect the available moisture to a tree also allow the bark beetle to operate more easily. Such factors include construction of roads and buildings and excessive soil compaction without adequate concern for the hydrologic relationship between the trees and the site on which they are growing.

Forest fires, which at one time regulated the density and diversity of the plant communities along the Front Range, have been greatly reduced. Lumbering, associated with the settlement of the Front Range, also removed extensive acres of pine type from the threat of the beetle. With the decrease in fire and logging, a new forest returned. This new forest is now at an age at which it will be thinned by nature due to the extreme competition for available moisture. The overabundance of trees competing for limited available moisture is the basic reason why the mountain pine beetle is operating at epidemic levels. To correct the problem we must

manage the forest at optimum tree density to maintain tree health through vigorous growth. This requires periodic harvesting of the stand. In the absence of man's management of the forest, natural factors will govern the tree density. The bark beetle is one of the natural factors.

There has been increasing public desire and Congressional action to allow natural processes to operate. The epidemic along the Front Range is an example of a natural process at work. While the losses are very visible and many fine specimens of trees are being killed, a forest is still present. Much of the Gross Reservoir area has young ponderosa pine and Douglas-fir seedlings present now to replace the trees that have been lost. An adequate ground cover of grasses and forbs is present, and we do not expect a noticeable increase in erosion.

Along the Front Range the opportunity to practice vegetation management is limited. The sawmill industry is very small and not geared to utilize the available tree products. We also have environmental constraints due to topography and social unacceptance to harvest in some areas. These diverse reasons limit the amount of control effort which can be directed at the beetle. We estimate that a 3-year effort requiring $36 million would be required. We do not feel this is viable since it is so expensive and treats only the symptom and not the problem.

Our current strategy is to treat only those areas which have high value resources and investments. These limited areas are cooperatively identified and treated by private landowners; the Colorado State Forest Service; and the Forest Service, USDA. Over the past three fiscal years the total cost of this project has been approximately $1,818,000 with the Federal share being approximately $699,500 or an average of 35 percent. These costs do not reflect the efforts donated by private landowners who treat trees on their property and do not charge the State.

If you have any further questions or comments, please contact us.

Sincerely,

F.A. DORRELL

F. A. DORRELL
Deputy Regional Forester
State and Private Forestry

cc: Mrs. Schroeder
3cc: WO
cc: OI
RF (R2-3329)
cc: Roosevelt N.F.

RDAverill:FADorrell:lds:meg

COLORADO

COMMITTEES:
ARMED SERVICES
PUBLIC WORKS

United States Senate

1200 WILLIAMS STREET
DENVER, COLORADO 80218
(303) 837-4421

5200

September 30, 1976

R-2
RECEIVED
OCT 0 8 1976
REGIONAL FORESTER

Mr. Jim Nelson
Office of Information
U.S. Forest Service
11177 West 8th
Lakewood, CO 80225

Dear Jim:

Enclosed are copies of letters which are representative of the many our office is receiving about the Forest Service's role in pine beetle control.

Your comments about this problem, especially those aimed at the funding status and the program guidelines, would be greatly appreciated.

Please feel free to call me if you have any questions.

Sincerely yours,

Lon McCain

Lon McCain
Staff Assistant

R7 (R2-3365)
7000M - Action.
OI -

Jefferson County Colorado

BOARD OF COUNTY COMMISSIONERS

HAL ANDERSON
District No. 1 Arvad

BOB CLEMEN
District No. 2 Lakewood

JOANNE PATERSO
District No. 3 Golde

August 12, 1976

RECD AUG 16 1976

The Honorable Gary Hart
United States Senator
6327 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Senator Hart:

We, as County Commissioners of Jefferson County, are very concerned about the funding, both state and federal monies, for the control of the MOUNTAIN PINE BEETLE as it affects the Front Range of Colorado, this including Jefferson County. The destruction of the trees by the Mountain Pine Beetles is affecting public values such as property value maintenance, aesthetic value, flood control and fire protection.

We ask you to examine the Forest Insect and Disease Management Program and Project Selection Criteria of July, 1976, as proposed by the U.S. Forest Service, U.S. Department of Agriculture, that does not take into consideration the major problem of the Mountain Pine Beetle as it affects the Front Range counties of this State.

During the year of 1976, there has been $683,700 spent in the total State of Colorado for the suppression of the Mountain Pine Beetle. The State of Colorado participated in the amount of 42.1% or $267,700; the federal government has participated 34.4% or $220,000; and, private parties have participated 23.5% or $150,000. Included in the state funding is an appropriation made by Jefferson County in the amount of $15,000, together with Open Space expenditures in the amount of $28,619 to control the lands under the Open Space Program.

As you can see, the total amount of monies appropriated will not meet the required expenditures necessary to suppress and control the affected areas in the Front Range.

1976 AUG 12 PM 3 17
RECEIVED AUG 19 1976

P.O.Box 1880
Estes Park, CO 80517
August 9, 1976

THE HONORABLE GARY HART
United States Senate
4213 Dirkson Senate Office Bldg.
Washington, D. C. 20510

Dear Senator Hart:

For the last four years the Allenspark Pine Beetle Control Committee has worked diligently to try to stem the tide of the epidemic of the Mountain Pine Beetle along the Front Range in Colorado.

With the excellent cooperation of the National and State Forest Service we have made some real progress. Our hope has been to reduce the newly atacked trees to what might be considered a maintenance level this year. We were well on the road to achieving that when both the State and the Federal Forest Services had to curtail their assistance to us because of budget cuts.

We understand that new, so called "guide lines" are being proposed for the expenditure of Forest Service funds; and that the funds will be spent in other areas, primarily in the areas where there is extensive timber industry.

A reduction in the help available to our area from either the State or Federal Forest Service at this time will completely destroy the results of our past four years efforts. Money spent to date on this area will have been wasted unless we can carry on for several years at least at the past level of activity.

In behalf of the 1200 landowners in the Allenspark area, I have been asked to write and urge that efforts to reduce the budget of the National Forest Service in this area be strongly opposed by you.

We need your help if our efforts of the past four years are not to have been in vain. Please give this matter your careful thought and consideration.

Sincerely

Elmer Ogren

Elmer Ogren, Chairman
Allenspark Area Pine Beetle Committee

EO:DS

We ask your support in requesting additional federal funds to support the Mountain Pine Beetle suppression project as it affects the Front Range counties of the State of Colorado.

Thank you for your cooperation on this matter of great concern to the total State of Colorado.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS
JEFFERSON COUNTY, COLORADO

Joanne K. Paterson, Chairman

Robert F. Clement

Harold A. Anderson

/jt

John O. U. Love Jr., LtCol USAF (Ret)
Box 7, Triple Creek Ranch
Allenspark, Colorado 80510

RECEIVED SEP 2 2 1976

13 September 1976

The Honorable Gary Hart
United States Senate
4213 Dirkson Senate Office Building
Washington, D. C. 20510

Dear Mr. Hart:

Four years ago a group of property owners in the Allenspark area formed the Allenspark Area Pine Beetle Control Committee. Using voluntarily donated funds, this committee has been responsible for gaining the interest and support of the National Park Service, National Forest Service and the State Forest Service to control and reduce the Pine Beetle epidemic. With good cooperation between the government agencies, the control committee and the land owners, the number of infected trees has been reduced each year.

The success of the program initiated by the control committee is quite evident when the Allenspark area is compared with the North St. Vrain Canyon, Big Thompson Canyon, Glenn Haven or other areas along the Front Range.

Presently the committee is faced with two difficulties. First, the weather for approximately the past twenty-four months has been ideal for the propagation of the beetle and its destructive activities, with the resultant increase in infected trees. The second difficulty ideally supplements the first - National and State funds for the prevention and cure of insect infestation of trees have been reduced to the point where it is no longer possible to hire the help and buy the materials needed to continue a successful fight against the Pine Beetle. If the Pine Beetle Control Program cannot be carried on at the same level of activity as in the past, just about all of the good work accomplished thus far will be wiped out.

Maintaining a healthy forest will benefit people in many ways. One of the more important, and possibly the most important, is the good water flow control that a healthy forest will provide. For this reason, if for no other, it is imperative that the additional funds required be allocated now so the work can continue until the Pine Beetle infestation is reduced to merely a year-to-year maintenance problem.

Mr. Hart, please exercise your influence to insure that adequate funds are made available for the prevention and cure of insect infestation of trees.

Thanking you for the time, effort and energy you devote to the above request, I am

Sincerely,

John O. U. Love Jr.

John O. U. Love Jr.

W. H. McNichols Jr.
MAYOR

City and County of Denver

CITY AND COUNTY BUILDING · DENVER, COLORADO · 80202

AREA CODE 303 297-2721

August 19, 1976

The Honorable Gary Hart
United States Senator
4213 Dirksen Senate Office Bldg.
Washington, D. C. 20510

Dear Senator Hart:

The Mountain Pine Beetle has infested great numbers of trees along the beautiful Front Range of Colorado. The destruction of these trees by the beetles is affecting public values such as property value maintenance, aesthetic value, flood control and fire protection.

The City and County of Denver, through our Parks Department, has been working with the Colorado State Forest Service and other counties involved to suppress and control the affected areas in the Front Range. However, funds are not sufficient to pay for the necessary steps that must be taken to eliminate the blight caused by these beetles.

I ask you to seriously consider the impact of this problem if it is allowed to continue unabated and strongly urge you to appropriate the necessary funds to control the spread of the Mountain Pine Beetle along the Front Range of Colorado.

Sincerely,

W. H. McNichols, Jr.
M A Y O R

AMERICAN REVOLUTION BICENTENNIAL

FRED E. ANDERSON
President of Senate
State Senator
1931 East First Street
Loveland, Colorado
80537

COMMITTEES
Vice Chairman of:
Appropriations
Member of:
Agriculture, Livestock and Water
Business Affairs and Labor
Audit Committee

THE STATE OF COLORADO
SENATE
DENVER, COLORADO 80203

August 30, 1976

RECEIVED SEP 13 1976

Senator Gary W. Hart
The Dirkson Senate Office Building
Room 6327
Washington, D. C. 20510

Dear Senator:

Your support is requested in asking for no cutback in the Mountain Pine Beetle Program.

The spread of the beetle in my opinion is critical and if we are going to preserve the forests, especially along the front range, this program must be continued.

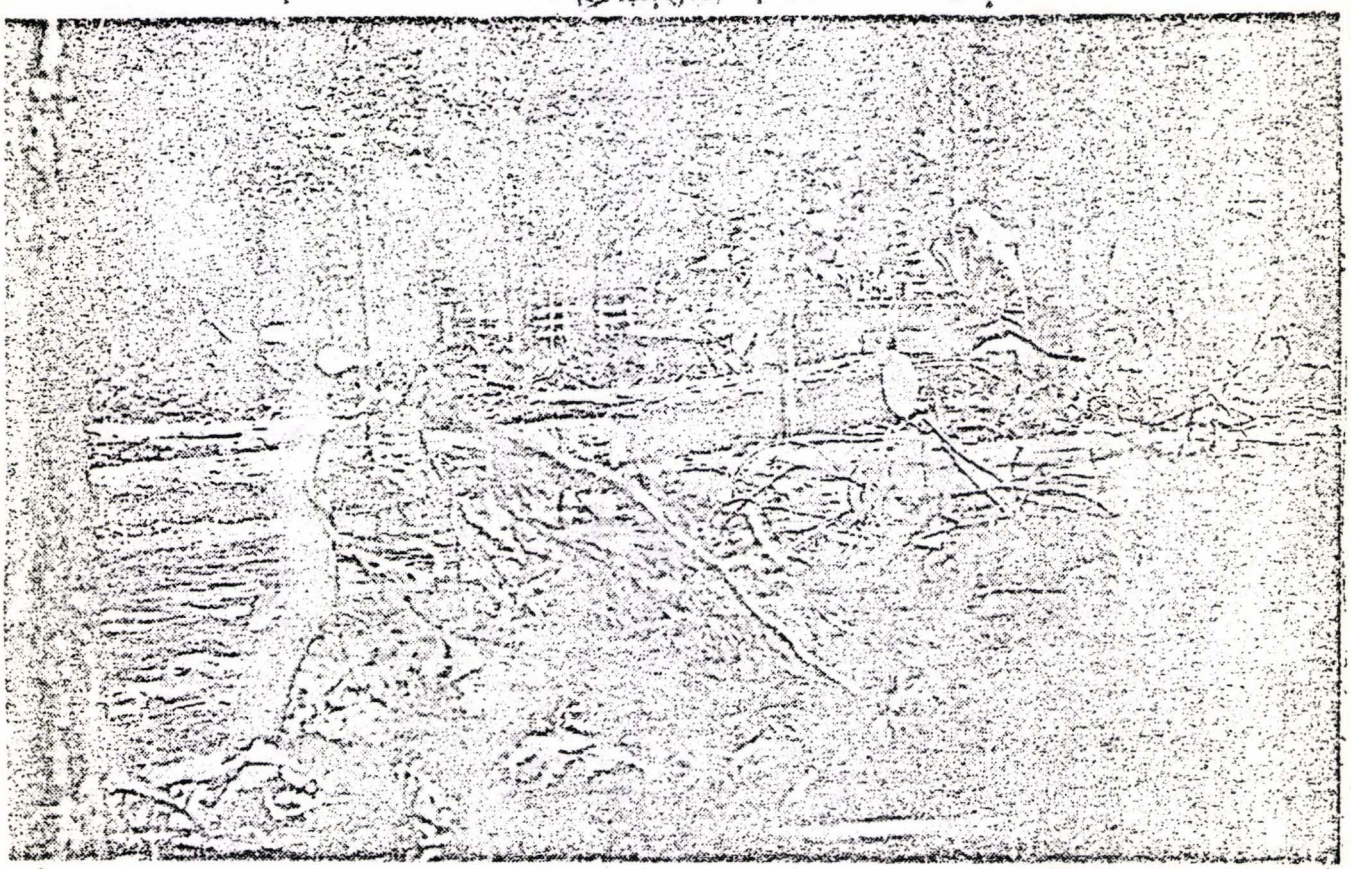
Any support you can give this program will be most appreciated.

Sincerely,

Fred E. Anderson
President of Senate

FEA/pb

Denver Post 6/22/76



Denver Post Photo by Steve Larson

PICNIC AMID DEBRIS

Debi Steinhilber, left, Denver, and her sister, Dori, Minneapolis, Minn., picnicked Monday at Bergen Park amidst the debris of trees fallen to halt the spread of the pine-bark beetle. Workmen have been removing diseased trees from Denver's mountain parks, public and private land west of Boulder and other areas of Front Range in an effort to halt the spread of the beetle, which ultimately kills trees it infests. Cut trees are infested or dead.

TREES CRASHING DOWN

Pine-Beetle Battle in Early Phase

Denver Post 6/20/76

By STEVE WYNKOOP
Denver Post Staff Writer

SUGARLOAF MOUNTAIN — Sounds of whining chain saws, the crackling of branches and the dull thuds of pine trees crashing to earth have filled this mountain community west of Boulder for weeks.

Area residents, assisted by state, federal and county officials, have been busy preparing for the annual summertime flight of pine bark beetles which this year will infest an estimated two million pines along Colorado's Front Range.

The pine beetles and the blue-stain fungus they carry combine to kill the pine trees they infest, Forest Service officials say. Weak trees in overcrowded stands are most susceptible. Strong trees in thinned stands can often withstand the beetle attack.

EFFORTS HAVE BEEN mounted all along the Front Range — but particularly in the residential mountain areas of Boulder and Jefferson Counties — to cut down infested trees and kill the beetles with chemical sprays and to thin pine stands to promote healthier trees.

Boulder County has created the position of county forester, a job held by forester Bob Saban, in response to public concern over pine-beetle damage.

A forest fire June 11 in Boulder County dramatized one of the concerns surrounding the pine-beetle infestation. The dry, beetle-killed trees are tinder for forest blazes that threaten life and property.

The beetle problem isn't new. There have been warnings of an epidemic infestation for years. But citizens appear to be mobilizing for action as never before.

THERE WAS RELUCTANCE to cut down green pines infested with the beetles, and a lack of realization that each one left standing could cause another five trees to become infested when the beetles fly in the late summer.

"There is definitely a group of people concerned about cutting down trees, but all they have to do is look around and see the trees are going to die anyway," said Sugarloaf resident Mrs. Christy Gunter, a leader in the community's beetle-control program.

"It doesn't feel good to cut down a tree, but it does feel good to get the beetles out of there," she said.

The Sugarloaf Beetle Control District is one of 11 in Boulder County receiving assistance from state, federal and county forest officials.

THE OFFICIALS CITE the Sugarloaf program as a model.

"You should see the housewives out there with their chain saws," Saban said.

Sugarloaf residents are preparing a handbook for other mountain communities to use in dealing with the beetle problem.

"The people in Nederland and Allenspark really helped us to get going," Mrs. Gunter said. "We want to do something so other areas won't have to start from scratch."

The booklet will give people tips the Sugarloaf residents didn't have when they began. For example, Mrs. Gunter said, it is possible to tell in early fall which trees have been infested and to begin cutting them instead of waiting for spring.

The booklet will also share information about thinning.

"MOST PEOPLE THINK A forest that has been thinned looks like a disaster area, but it doesn't. The wildflowers grow under the trees.

"We've thinned, and we didn't lose any trees (to beetles). We had some hits, but the trees were healthy enough to pitch the beetles out," she said.

"When people see an area the beetle has thinned, then it looks like a disaster area," she added. In those areas, when all the dead trees are cut down, only a few tiny trees are left, she said.

The pine beetles are always present in the forests along the Front Range, forestry experts say.

The beetles fly in late summer from trees where they have been hatched.

They bore into the bark of the new trees and lay eggs there if the trees aren't healthy enough to discharge sap to force the beetles out.

CONTROL EFFORTS are built around the life cycle of the beetles. Infested trees are usually cut down in the spring and early summer and the bark sprayed with chemicals that kill the beetles.

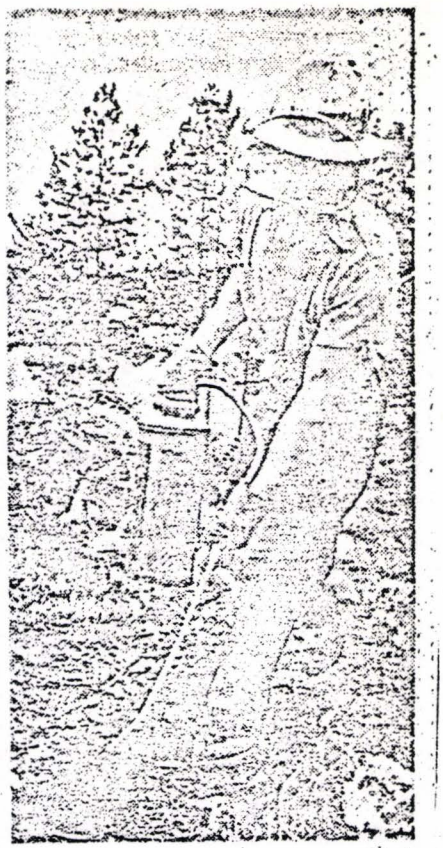
Pesticides which protect the pines are available from commercial tree-care firms, but forestry officials say the chemicals would be too expensive to apply on a widespread basis.

The most urgent need, Oppenlander and Saban agreed, is a commitment to a long-term forest-management program which will keep the tree stands healthy.

That would mean timber sales on public forest lands and thinning of stands on private lands, they said.

The Forest Service has begun to sell beetle-infested timber and to employ people to cut down infested trees on public land. The blues-stained pine, Oppenlander said, is beginning to be marketed as paneling. Other timber is being used for fences and a variety of other uses.

Without management, the pine forests of the Front Range will continue to be thinned nature's way—with forest fires and the pine beetle.



CARL HIEBERT SPRAYS LOG
Chemical kills beetles, larvae.

FOREST SERVICE EMPLOYES DICK GEMMEL, LEFT, AND PHIL CONNOLLY FELL TREES
They work in a Forest Service beetle-control area thinning pine stands to promote healthier trees.

Annual Pine Beetle Fight Takes Shape

State and U.S. forest officials are gearing up to resume the annual battle against the mountain pine beetle, which still is killing ponderosa pines by the thousands in this region.

Bob Averill, forest entomologist for the U.S. Forest Service in Region 2 headquarters in Denver, said there are no indications that the outbreak is slacking off.

The biggest effort, he said, will begin in late May and early June, when manpower is available in the form of college students on summer vacation.

That big effort will be chemical control — cutting down infected trees and spraying them with pesticides to kill the beetles before they begin flying to other trees, which starts in early July.

BUT THE FOREST SERVICE'S basic effort to whip the beetle gets to the heart of the matter and is a year-around project — forest management.

The real cause of the beetle outbreak, Averill said, is too many trees in most areas. When trees are jammed together, he said, they all become weak by robbing each other of the proper amount of moisture and nourishment — as garden vegetables would do if you let them grow too close together.

A strong and healthy tree usually can ward off beetles by pushing them out of their holes and tunnels with sap, but a weak one usually can't do that, Averill said.

So forest management means thinning the stands of trees, and state and U.S. forest officials strongly recommend it for private landowners.

"WE HAVE TAKEN FIRE out of the (forest) environment," Averill said, "and there hasn't been an adequate harvest (of trees) going on.

"If man doesn't intervene in nature (to establish control), nature will manage in her fashion. This means that the forest may have to collapse and then rejuvenate herself.

"The beetle is a natural regulating factor and now is doing his thing."

FOR THE PRIVATE LANDOWNER, Averill recommends a new pesticide, Pine Tree and Ornamental Spray, which the landowner can spray on living, standing trees to protect them against the beetle. It is available in many hardware and garden stores.

Averill said the new spray appears to kill beetles when they first attract a tree, but it also may make the tree unattractive to the bugs. The beetles kill a tree by infecting it with blue-stain fungus, which spreads through pulpwood and chokes off water passages.

The spray has been registered by Colorado Environmental Protection Agency officials and is being tested this year by the Forest Service preparatory to asking for national registration.

Private landowners who want to band together and set up a pine-beetle control area should contact the Colorado State Forest Service. The U.S. Forest Service will participate in such cooperative ventures if federal land is in the area.

Wirth Raps Front-Range Beetle Funding

By STEVE WYNKOOP
Denver Post Staff Writer

Rep. Tim Wirth, D-Colo., said Wednesday that Forest Service proposed funding guidelines for next year could seriously impair efforts to control pine beetle infestations along the Colorado Front Range.

The Forest Service, this year, is providing $292,000 in funding to control the beetle, which is killing 3 to 5 million pines annually.

State and local government funding amounts to about $500,000.

Wirth said the guidelines are "shortsighted" and "stacked in favor of the timber industry."

IN A PROTEST LETTER to Forest Service chief John McGuire, Wirth objected to proposed Forest Service guidelines which would allocate scarce insect-control funds primarily to timber stands valued for commercial timber harvesting.

There is little commercial timber in the Colorado Front Range stands infested with the pine beetle.

"I strongly urge that you give increased consideration to such public values as fire prevention, flood control, recreational and esthetic value and property value maintenance," Wirth told McGuire.

WIRTH TOURED an area of Boulder County on Monday where beetle-control programs are underway.

The Forest Service has been cooperating with mountain residents who have established pine-beetle control districts. Rangers have been cutting down dead and infested trees on national forest lands.

The proposed criteria were published by the Forest Service this month.

George Downing, director of the regional Forest Service insect disease program, said the major change in the new criteria pertains to identifying the federal role in supplying cost-sharing funds to states for insect-control programs.

DOWNING SAID under the proposed criteria "it is possible" Colorado could lose funds.

The Forest Service last year provided the State of Colorado $220,000 in cost-sharing funds. Those funds are used to control pine beetles on private land.

The balance of the $292,000 in Forest Service funding is used on Forest Service lands.

Downing said he expects the new criteria will be published in final form within the next six weeks so they will be ready to serve as the basis for allocating funds beginning Oct. 1 for the 1977 fiscal year.

Denver Post
7/28/76

10 Fort Collins Coloradoan Tuesday, July 27, 1976

Forest Service rapped for its guidelines on insect management

LAKEWOOD, Colo. (AP) — After a tour Monday of pine beetle-infested areas in Boulder County, Rep. Timothy Wirth, D-Colo., blasted the U.S. Forest Service for its guidelines on forest insect and disease management.

Wirth called the guidelines "shortsighted" and "stacked in favor of the timber industry."

Wirth said he is sending a letter to Forest Service chief John R. McGuire that urges "increased consideration for such public values as fire prevention, flood control, recreational and aesthetic value and property value maintenance."

In his letter, Wirth contends the current guidelines ignore the unique problems of the mountain residential areas on Colorado's front range, including Boulder and Jefferson counties.

"The way it stands now, if the timber industry can't make money cutting these trees, the Forest Service seems prepared to wait until they burn down," he said.

Wirth said he received assurance earlier of continued funding of the control program through Sept. 30, 1976. However, he said funds for the 1977 fiscal year currently are undergoing re-evaluation.

The Estes Park
TRAIL-GAZETTE

Editorial Opinion

Don't Ignore Us Now, USFS

It is evident, from a position statement issued by the U.S. Forest Service (USFS), that the responsibility for control of the mountain pine beetle has been left up to the Colorado State Forest Service (CSFS) and cooperation of property owners.

In reply to questions asked by Congressman James P. Johnson, the USFS pointed out that several changes have taken place in the pine forest along the Colorado Front Range in the past half-century which have led to increased beetle activity.

According to the USFS, fire—once a significant natural force in maintaining a diversity of species and age classes—has been drastically reduced.

In addition, logging activities that accompanied the settlement of the Front Range resulted in large-scale removal of trees for various uses.

The combination of fire and logging temporarily reduced the acreage of trees susceptible to pine beetle infestation.

USFS said that the gradual decline in logging activities and the successful efforts to prevent and control fires allowed trees to become established in greater numbers over the years which has resulted in a constantly increasing competition between trees of all ages for available moisture and soil nutrients.

The competition plus increased age has in turn caused a decline in the vigor of trees with a concurrent increase in the beetle activity, USFS said.

The beetle will continue to attack Front Range trees until some means is found for managing those stands, USFS added.

It is not man but the beetle which is controlling forest management and so long as this situation discontinues the beetle is king.

USFS pointed out that there has been increasing public desire and Congressional action to allow natural processes to operate—a fact which also works to the advantage of the beetle.

The federal agency in its letter to Congressman Johnson readily admits that it needs guidance from the public on a new management concept which takes into consideration that commercial havesting is not now feasible and that present control methods really don't solve the long-term problem.

USFS also makes a point of mentioning that federal money for state beetle control efforts is being constantly questioned because the present program does not provide a lasting remedy.

While the USFS has done a thorough analysis of the problem and is aware of the finer points of management technique, its lack of aggressiveness is appalling.

What the federal government should do is provide interim funding for beetle control until a comprehensive program can be worked out.

By temporarily washing its hands of the entire matter, USFS has placed the financial burden on the back of the Colorado State Forest Service and concerned property owners.

Although the cutting and spraying of beetle trees may not be the permanent remedy which the federal government is happy with, it has been very satisfactory locally and there is evidence that expansion of the program could provide a highly effective long-range method.

USFS should provide some dynamic leadership now before it is too late and the beetle fulfills USFS predictions.

Revised federal guidelines

State to lose $250,000 to fight pine beetles

By GEORGE GUDAUSKAS
News Staff

Revised federal guidelines will keep Colorado from qualifying for $250,000 it needs to combat a pine beetle infestation which could destroy 30 to 50 per cent of the ponderosa pine along the front range within 10 years.

"That's the feedback we're getting from Washington," said Dave Sonnen, a state Forest Service administrator who has prepared an overall $400,000 matching fund program to continue the battle against the bugs.

Guidelines recently issued by the U.S. Forest Service will allow insect control funds to be granted by the government only for forests used in commercial lumbering operations, Sonnen said.

"We have very little commercial timber in Colorado," said Sonnen.

Colorado officials said the U.S. Forest Service proposed changing existing guidelines for distribution of funds for insect control following talks with the U.S. Office of Management and Budget (OMB).

Colorado has one of the largest control projects in the nation, according to state officials.

REP. TIM WIRTH, D-Colo., in a letter to U.S. Forest Service chief John McGuire, said the guidelines cater only to lumbermen and are shortsighted.

Wirth's complaint came following a tour of beetle-infested areas in Boulder and Jefferson counties, currently the hardest hit along the front range.

"It's in the epidemic stages," Sonnen said.

Thirty to 50 per cent of the ponderosa pine is threatened over the next decade if the beetles aren't controlled, he said.

Sonnen said unless the U.S. government comes through with its share of the financial package he plans to submit Aug. 15, "We're not going to have much forest to manage."

A program to combat the bugs has been in effect for some time. Last year the project cost $400,000 and had heavy local participation.

This year's request again will seek $400,000 — $250,000 from the federal government, $110,000 from the state and $40,000 from private landowners.

THE PROGRAM ALSO envisions abundant local volunteer help valued at another $250,000, Sonnen said.

The mountain pine bettle, a black bug about the size of a kitchen match head, is always in the forests of Colorado, Sonnen said, and at times gets the upper hand.

The beetles swarm and attack living trees in midsummer. They bore into trees to breed and lay eggs just beneath the bark, beginning a one-year life cycle that soon kills the tree.

The beetles, which spend nearly their entire lives within the trees they attack, also carry a killing bluestain fungus and can infest as many as 1,000 trees in a season. A total of 10,000 acres of trees is expected to be affected by the bugs. The loss could run as high as $2 million, forest officials said.

Cutting down infested trees and spraying them with an environmentally safe chemical

Denver Post
8/1/76

★★THE DENVER POST Wed., Feb. 9, 1977

OMB Extends Support For Pine Beetle Battle

Denver Post Washington Bureau

WASHINGTON — The Office of Management and Budget (OMB) announced Tuesday that it plans to continue funding a program to fight the spread of the mountain pine beetle along Colorado's Front Range.

The extension of the three-year-old program had been in doubt since last July when the U.S. Forest Service announced it was planning to withdraw from the project.

The budget office, however, said $137,500 would be allocated from a contingency fund to continue the program another year.

The pine beetles, about the size of a kitchen-match head, have killed millions of ponderosa pines in the foothills.

Under the program, the Forest Service, the Colorado state forester and private landowners are given funds to remove and treat infested trees before the beetles spread.

THE DENVER POST Mon., Mar. 7, 1977

Pine Beetle Damage To Trees Subject of Boulder Symposium

Denver Post Boulder Bureau

BOULDER—A symposium on the mountain pine beetle will be at 7 p.m. Tuesday in the auditorium of the National Bureau of Standards, 925 S. Broadway.

Speakers will include Jim Ficke, district ranger for the U.S. Forest Service; Bob Saban, forest manager for the Boulder County Parks and Open Space Department; Dave Stevens, resource management specialist for the National Park Service; Dick Shannon, forester for the city of Boulder parks department; Rich Selle, of the Colorado State Forest Service, and Gerald Branveld, area manager for the U.S. Bureau of Land Management.

The symposium is sponsored by Boulder County, and the public is invited.

The mountain pine beetle has destroyed thousands of trees on city, county, private, state and federal land in Boulder County. Residents have been demanding an all-out campaign against it.

—Rocky Mountain News Fri., Sept. 10, 1976, Denver, Colo.

New guidelines drawn

Colorado seeks beetle-fighting funds

By GEORGE GUDAUSKAS
News Staff

The U.S. Forest Service is changing its guidelines to try to assure Colorado continues to receive money to fight an infestation of tree-killing beetles on the Front Range, a federal official said Thursday.

But Phil Thornton, deputy chief for state and private forestry in the Forest Service, said in a telephone interview that, despite the guideline changes, "two hookers" exist that still could jeopardize continued funding.

He said that final approval of changes in the guidelines must come from Agriculture Secretary Earl Butz and from the President's Office of Management and Budget — and that "there must be enough money to go around."

Thornton indicated, however, he's all but certain Colorado will be able to get the money it needs to continue to wage war on the tree-killing mountain pine beetle.

Colorado is asking the federal government for $250,000 to continue its years-old program for controlling the bugs. The federal money would be matched by state and private contributions, bringing the program's total value to more than $400,000.

Without the financial aid, the beetles could gobble up 30 to 50 per cent of the ponderosa pine on the Front Range over the next 10 years, according to Dave Sonnen, assistant state forester.

As they were previously worded, the Forest Service guidelines would have allowed insect-control funds to be granted by the federal government only for forests used in commercial lumbering operations.

Since Colorado has very little commercial timber activity, it would have been cut off from its source of funds, a situation that caused a stir among state officials and Rep. Tim Wirth, D-Colo.

Thornton said the newest revisions in the guidelines attempt to show that pine forests are important for several reasons, including commercial timber. He cited recreation, wildlife habitat, watershed and other uses.

Thornton said that from $8 million to $9 million should be available from the federal government for insect-control programs in the various states. He said competition for federal money may be tough, however, because of more bug activity this year throughout the nation.

Thornton said it would be several months before the guidelines are approved, but Colorado should know long before then whether it will be getting money.

Sonnen said he expects to know whether the state will receive federal funds by Sept. 30.

THE DENVER POST Wed., Mar. 9, 1977

Volunteers Plan to Join Boulder Pine Beetle War

By JANE CRACRAFT
Denver Post Boulder Bureau

BOULDER — City, county, state and federal foresters described their efforts to control the mountain pine beetle at a symposium Tuesday night, but E. H. (Ed) Cole wasn't convinced.

After the public employes finished talking, Cole announced that he is incorporating a group called Volunteer Foresters of Colorado to help thin 140 or 150 acres the weekend of April 16. He hopes to marshal 500 to 1,000 experienced, but volunteer, woodsmen.

In an interview, Cole said mountain lovers can't wait for the public agencies to finish chipping away at the task.

Already, 10,000 acres of Front Range forest have been destroyed by the mountain pine beetle, according to Colorado State Forest Service estimates. The state agency believes that $2 million would be required to beat the beetle infestation, but only a fraction of that amount has been spent so far.

Cole said volunteers have to help.

"I DON'T SEE any choice," he said. "If we don't do something, we are going to have big fires. It is as dry now as it was last summer. It's scary."

Cole, who lives in the mountain community of Wallstreet, organized volunteers last year to thin a 40-acre tract. He said about half of the volunteers came from the Denver area, and they were well equipped to do the task.

"We can't provide anything except the opportunity to come out and help save some forest," Cole said. He added that the workers are incorporating in hopes of avoiding some of the legal risk that they take. The volunteer agency can't afford liability insurance.

Foresters for public agencies ahve warned Cole that his project is a risky one and said that proper forest management should rest in the hands of experts.

At the symposium, Bob Saban, Boulder County forecaster, said the forests have been "overprotected" and are in a "very artificial" condition. He explained that nature's way of controlling a pine beetle epidemic is to let the dead trees — and many nearby healthy ones—burn.

"But we have too many people living in the mountains and we can't let the forest burn unchecked."

Saban was asked if there are any natural predators for pine beetles. He said there are at least two, but using them would lead to other problems. One is a wasp that would have to be imported in great numbers and the other is a variety of woodpecker.

"We could release thousands of woodpeckers to eat the beetles, but when the beetles are gone, we'd get frantic calls from people saying, 'Would you come and take the woodpeckers off my house.'"

Ron Gosnell, a state forester, said the common approach to kill the pine beetle is to identify diseased trees, fell them, and then douse the logs with a chemical. The chemical used dissipates quickly and doesn't have long-term effects on soil, wildlife or streams, Gosnell said.

He added that 10 mountain neighborhoods in Boulder County have been designated as "control areas," where the state is helping local residents remove diseased trees and thin the forest to create healthier trees.

Jim Ficke, district ranger with the U.S. Forest Service, said there have been efforts to control the pine beetle in Boulder County since the early 1900s. He said it is an insect that occurs naturally and that isn't a problem most of the time. But when ponderosa pine forests are too thick, the individual trees grow slowly and are less resistant to the disease carried by the tiny black beetle, which burrows under the bark.

Ficke said nearly 5,000 trees were cut in the designated control areas last year, with $25,000 to $30,000 spent.

Dave Stevens, a resource specialist for the National Park Service, said a different approach is used in the national parks, where nature is allowed to run its course as much as possible. The only active control efforts are on the boundaries of the park, where infected trees could spread the pine beetle problem to private or state land.

Boulder County and the city of Boulder have each hired foresters in the last year. Boulder is spending $120,000 to fight the pine beetle in its mountain backdrop.

NEWS PHOTO BY BILL PEER

Mountain pine beetles killed these ponderosa pines in Boulder County by boring beneath the bark to breed and lay their eggs. Infested logs have been doused with a chemical spray, with the plastic tarp covering the pile for 10 days as the chemical kills the beetles. Colorado may lose its federal financing for beetle control.

THE DENVER POST ZONE 3 Wed., Mar. 16, 1977

$233,500 Received In Pine Beetle Fight

GOLDEN — Federal, state and county funds totaling $233,500 have been received by the Golden District of the Colorado Forest Service for mountain pine beetle treatment according to Chuck Dennis, assistant forester.

We have received cooperation from the counties and organizations in our district, and this virtually guarantees that mountain landowners within our control area can expect full treatment assistance this summer," Dennis said.

MONETARY breakdown for the 1977 program is: Jefferson County, $25,000; Clear Creek County, $3,000; Park County, $3,000; Jefferson County Open Space, $35,000; Denver Mountain Parks, $50,000; Colorado Division of Wildlife, $500; Colorado State Forest Service, $65,000, and U.S. government, $52,000.

Large money grants cannot be expected to continue. To counter this possibility, Golden District is making a three-year transition from direct treatment to that of making the timber stands themselves more insect-resistant through proper forest management," the forester added.

"We will be concentrating on reducing the number of infested trees, so that by the third year we can handle the majority of infested trees through recommended management harvests," he said.

Persons wishing information on mountain pine beetle control may contact the Colorado State Forest Service at 1504 Quaker St., Golden 80401, telephone 279-9757.

THE DENVER POST Fri., Mar. 25, 1977

IN OTHER ACTION . . .

MOUNTAIN PINE BEETLES are the target of a $219,889 work program approved 8-1 Thursday by the Agriculture, Livestock and Natural Resources Committee of the Colorado House.

The measure, introduced by Rep. Lee Jones, R-Boulder, would use 10 inmates from the Colorado Correctional Center at Golden to fight the beetle infestation all over the state. Most of the money is for equipment and transportation.

Rocky Mountain News Fri., March 25, 1977, Denver, Colo.

Beetle battle

The House Agriculture Committee approved a $219,889 work program that would use Colorado Correctional Center inmates to fight mountain pine beetle infestation in the state.

The committee voted 8-1 to send the bill, sponsored by Rep. Lee Jones, R-Boulder, to the House Appropriations Committee.

Bruce Coulter, who coordinates a pilot project using 10 inmates from the center at Golden for the Colorado State Forest Service, said the funds would be used mostly to acquire buses to transport prisoners to areas with infected trees and to acquire equipment.

According to Coulter, inmates who have been working north of Evergreen since mid-November will have treated 450 acres by the end of June.

Associated Press

COLORADO

FRONT RANGE VEGETATION MANAGEMENT

PUBLIC AND POLITICAL CONCERNS

Elsie W. Cunningham
Public Information Specialist
R-2 Office of Information
April 1977

COLORADO

FRONT RANGE VEGETATION MANAGEMENT

PUBLIC AND POLITICAL CONCERNS

Definition of Issue

Federal, State and private lands are sustaining excessive volume and growth losses due to insects and diseases. Associated with these losses are wasted fiber, increased fuel accumulation and limited ability to achieve potential yields that directly affect social, economic and environmental settings.

The mountain pine beetle is a natural component of ponderosa pine forests and earliest records report epidemics back to the beginning of this century. Many attempts to control outbreak populations of this beetle have been made over the years, the earliest efforts dating back to 1908. Temporary suppression has resulted from these efforts, but insect populations have always returned to high levels within a few years. We currently have an epidemic outbreak in Front Range ponderosa pine. Over one million trees are being killed each year.

The Pest Control Act (Article 4, Chapter 35, Colorado Revised Statutes, 1974) is the existing authority for the State Forest Service. It calls for the State Department of Agriculture, either directly or through county pest inspectors, to inspect lands to determine if they are infested with pests and devise means of control, when possible. On May 1, 1972 an order was enacted declaring the mountain pine beetle a pest and subjecting it to the terms and conditions of this article.

The Forest Pest Control Act (P.L. 110, June 25, 1947) provides for the protection of forests against destructive diseases; independently and

through cooperation with state and local governments and private timber owners. It specifically states ". . . to prevent, retard, control, suppress or eradicate incipient, potential, or emergency outbreaks of destructive insects and diseases on, or threatening all forest lands irrespective of ownership." This is the existing authority for federal forest pest management.

Between 1974 and 1976 the Forest Service provided approximately $699,500 in Federal funds, combined with approximately $327,000 in State general funds for direct bark beetle control on private lands in the Front Range. During the 1975-76 fiscal year, $299,000 was contributed by private land owners. "Direct control is, however, a short-term, stop-gap action and does not provide the lasting relief desired." (McGuire-Wirth 8/76)

Because of the increasing public and political concern about the mountain pine beetle, Region 2 OI prepared a detailed I&I Plan in 1976. Some of the specific goals and objectives were:

1. To provide interested publics with information.
2. To establish a process to keep in-service personnel informed and involved.
3. To better insure coordinated communication with news media and contact with organizations and individuals.
4. To "critically listen" to the various publics in order to identify potential issues associated with the problem before they become critical.
5. To educate the publics to the values of harvesting timber as a silvicultural tool.

The Plan never became operational and Region 2 assumed a low profile and played a low key role. Our efforts have mainly been in response to congressional inquiries but we have also tried to stay in the background and channel routine requests to the State Forest Service.

Public and Political Reaction

Within the past two years phone inquiries have been handled in the Regional Office (Forest Pest Management and Office of Information Staff Units) at the rate of 2-3 per day. Numerous letters have also been received. Most notable among the concerns expressed are:

-- shock and disbelief at seeing trees destroyed by disease.
-- trees are important to prevent wind and water erosion.
-- high visibility of the dead timber.
-- impact on aesthetic values.
-- proximity of epidemic to population centers.
-- nothing is being done to eliminate the problem.
-- remove affected trees to prevent spreading; plant new trees.
-- funds and manpower must be allocated.
-- trees are becoming systematically destroyed.
-- property owners have formed local action team, raised funds and are doing as much as possible; need federal assistance.
-- fire threat
-- property values
-- Federal program provides too little - too late

We have also received inquiries from members of the Colorado congressional delegation. Senator Floyd Haskell, in his August 1976 letter to Chief McGuire, expressed concern about the seriousness of the mountain pine

beetle infestation in Colorado and the State's apparent difficulty in qualifying for federal insect suppression funds. He indicated that his constituents, as well as the State Forester, were convinced that funds are urgently needed to continue the effective and successful projects which have been launched by the State. In his reply, the Chief stated the Forest Service shares your concern about the seriousness of mountain pine beetle infestation; every possible consideration will be given to Colorado's FY 1977 project proposal. Representative Patricia Schroeder, though not indicating a position, has queried the Forest Service as to whether federal funds could be used to alleviate the mountain pine beetle problem. In July 1976, Representative Tim Wirth publicly condemned proposed Forest Service guidelines on forest insect and disease management, calling them "shortsighted" and "stacked in favor of the timber industry." He urged increased consideration for fire prevention, flood control, recreational and aesthetic value and property maintenance. "These programs have had great success and impressive local support," said Wirth. "Cutting off funds now would be an irreversible mistake." Copies of Chief McGuire's and Regional Forester Rupp's replies are enclosed. W here?

Representative Charles Thone (Nebraska) and Senator James Abourezk (South Dakota), while not directly involved with the Front Range problem have expressed opinions that all areas of forest management, including insect and disease control, are important to total management of our timber resources. Senator Abourezk, prior to May 1976, asked the Appropriations Committee for an increase in funds to control mountain pine beetle. He stated that the statistics of damage are the strongest argument for

substantial federal attention.

The Colorado State Forest Service, with District Offices located in Golden, Longmont, Denver and Fort Collins has carried on an extensive I&E Program which now prompts approximately 13,000 phone calls and letters each year. In addition, the State holds 200-250 public meetings, prepares 30-50 press releases and participates in numerous radio programs. According to a spokesman, people are pretty well informed about the biology and other related problems associated with mountain pine beetle - their questions now related to who is going to do what, and when? The State will, in the future, respond to inquiries by placing more emphasis on indirect control (forest management) rather than direct control.

Highlights of State I&E during 1976 are:

1. Woodsman Program - pilot program in Jefferson County which utilizes skills of select minimum security inmates from Canon City. Program began in November - work is related to general forest management, including mountain pine beetle control, and is apparently showing some accomplishment.

   The pilot crew produced the following results in the board feet of lumber in timber cut, and cordage of firewood produced. All of this timber was felled with chain saws, cut into usable timber lengths for sawmill use, cordage for firewood, all of which was hand carried from the fall to the road side so it could be picked up. All remaining slashings were reduced to an 18" height and scattered over the harvested area for re-fertillization.

Production to December 31, 1976	Man Days Involved	Board Feet of Lumber Cut	Firewood Cordage
November	103	6,875	55
December	147	7,035	47
TOTAL	250	13,910	102

Next fiscal year the program is to be expanded and $200,000 has been requested.

2. Production of the "Silent Killer" - a 15 minute color film about mountain pine beetle, its life history, habits and methods of control. This is well done and adapted for the lay person.

3. KOA-TV 4, Terry Phillips - September or October. A 5 part series on "Ponderosa Pine Hit Man." This was based on the film Silent Killer, and Phil Johnson, Information Officer at the Rocky Mountain Forest and Range Experiment Station, assumed the leadership role in presenting this to the general public.

Samples of correspondence, news releases and newspaper clippings relative to the mountain pine beetle problem are enclosed. These samples not only relate to the public concern but also show our efforts in dealing with the situation. Also enclosed are copies of hand out material which is given to the public, and photographs showing the impact of mountain pine beetle on five residential forest communities and the key values.

Legislation has been introduced this session of Congress to create a Young Adult Conservation Corps. The intent of this legislation is to provide employment for young adults, especially those residing in areas having a

high rate of unemployment, to complete labor intensive projects within the forests and parks. Priority work projects shall be insect and disease control. There are numerous other bills now pending in Congress related to Youth Employment Programs which, if passed, could indirectly provide funds to be used for prevention and control of the mountain pine beetle on Forest Service land.

A draft bill to revise research and S&PF authorities (Talmadge), to a limited extent, does expand the mission of S&PF in an attempt to be responsive to public concern and new directions from Congress. (i.e. insect and disease problems in urban trees, and expanded pest control authority to protect wood in use or storage) The insect and disease control language includes all lands - Federal as well as State and private. This is consistent with the nature of pest control activities that must cross land ownership lines and with current practices under existing legislation.

In the Colorado General Assembly H.B. 1555 was introduced on March 15, 1977 by Representative Lee R. Jones (Boulder) et al. If passed, this bill will authorize the State Board of Agriculture, acting as the Colorado State Forest Service, to enter into a cooperative agreement with the Division of Corrections to provide a cooperative work program for the purpose of implementing a mountain pine beetle control program. The sum of two hundred nineteen thousand eight hundred eighty-nine dollars ($219,889) will be appropriated out of money in the State Treasury for implementation of this act and will remain available through June 30, 1978. This legislation is an extension of the pilot program initiated in November 1976. It is designed to provide correctional center residents with a

broad background in forestry related activities and actual work experience in forest service management programs, specifically mountain pine beetle control.

Conclusion

The Forest Service USDA is responsible for the protection, administration and management of National Forest lands. Along the Front Range the lands are administered to provide an optimum output of recreation, wildlife and aesthetics. Current efforts dealing with mountain pine beetle on National Forest lands are aimed at overall forest management.

Appendix D

Specialists providing interdisciplinary input to the environmental analysis:

Jesse Tomkins, USFS	Geologist
Robert Malmgren, USFS	Soil Scientist
Calvin Conklin, USFS	Hydrologist
Don Patterson, USFS	Landscape Architect
Jim Cruse, USFS	Wildlife Biologist
John Oppenlander, USFS	Forester (Fire)
John Barber, USFS	Engineer
Tom Lonberger, USFS	Forester (Watershed)
Ralph Johnson, USFS	Forester (Land Uses)
Rich Selle, CSFS	Forester (Timber)
Jim Ficke, USFS	Forester (District Ranger)
Bob Averill, USFS	Entomologist
Dennis Keaton, USFS	Forester (Planning)
Ross Mosier, USFS	Forester (Cultural)
Ray Mehaffey, CSFS	Forester (Land Uses)
Dave Sonen, CSFS	Management Analyst
Lee Carr, USFS	Forester (Public Information)
Bob Saban, Boulder County	Forester (Forest Management)
Jim Getter, CSFS	Forester
Steve Sigstead, USFS	Archeologist

CSFS = Colorado State Forest Service
USFS = United States Forest Service

APPENDIX E

Alternative Analysis Rationale

Output of Goods and Services Rating - Table 4

Recreation

Developed

Alternative 1 would let the beetle epidemic continue which would put existing developed recreation sites in jeopardy. That eventually will reduce the attractiveness of these sites. Under Alternative 2, existing sites would be protected, retaining the status-quo. Potential developable sites would remain vulnerable to the beetle attack. Alternative 3 would protect and enhance existing as well as potential developed recreation sites.

Dispersed

Alternative 1 would allow the area to rapidly deteriorate visually and this would result in dispersed recreation use to remain static. Some activities would go down in use while others would increase in use such as wood product gathering. Alternative 2 would have treated areas, that would maintain scenic quality and provide opportunities for wood product gathering. The intensive treatment under Alternative 3 will provide better access to public lands by dispersed recreationists. Scenic quality will be improved or maintained. Combination of access and attractibility will provide for an opportunity to increase recreation use.

Property Value Loss

Refer to Benefit-Cost Analysis for rationale.

Water Yield (Long Term)

None of the three alternatives will have significant increases in water yield. Increasing water yield is dependent on making small openings (about 5 acres) to redistribute snow pack and make it available for additional runoff. Individual trees removed or killed by beetles will have little effect on runoff. Alternative 1 will have most of the dead trees standing and not leave any appreciable size openings. Alternative 2 and 3 may create some beneficial openings but these will be negated by the larger clear cut openings which tend to decrease water yield. In addition, most of the openings are expected to be in the eastern half which has lower precipitation and less snow which means less chance to alter water yield.

Fisheries Habitat

Alternative 1 has the highest wildfire probability resulting in the greatest potential for sedimentation. This would have a significant

impact on the aquatic habitat. The effects of current management (Alternative 2) would result in little change from the present situation. Some improvement in fisheries habitat is expected in Alternative 3 by prevention of large wildfires and maintenance of watershed quality through vegetation management.

Wildlife Habitat

Alternative 1 will create the greatest impact on big game habitat by drastically reducing the amount of cover on summer and winter range. The effect on small game and non-game is difficult to estimate because of the wide range of habitats represented by the broad grouping; however, reducing the number of trees will have a detrimental impact on existing populations which are primarily associated with the forest. Alternatives 2 and 3 ratings are changing as the degree of habitat changes. Alternative 3 gives the greatest opportunity to arrange forest habitat in a pattern of best diversity, optimum density and successional stages for wildlife.

Resource Values Protected From Fire

Biotic factors, such as trees, scenery, watershed, wildlife and fisheries were considered here as well as property values and homes. Refer to benefit-cost analysis in Appendix F. The potential wildlife danger is highest in Alternative 1 with no fuel management and least in Alternative 3 with the fuel management program offering the most resource value protection.

Fire Suppression Costs Prevented

Wildlife is a serious concern in the project area. The output for this element is the amount of fire suppression dollars saved by fuel management. Alternative 1, which has no expenditure for fuel abatement will have the highest cost for fire suppression. Alternative 3 shows an estimated savings of $775,788 based on estimated acres burned and actual fire costs from the Comforter Mountain Fire.

Standing Timber

The figures are estimates of the amount of living trees after 50 years. The units used are Mbf (million board feet) and cunits (100 cubic foot of wood volume). Obviously Alternative 3 will provide the greatest amount of standing timber.

APPENDIX E

Alternative Analysis Rationale

Environmental Effects - Table 7

Effect of Insecticide On --

Wildlife - There are no environmental effects in Alternative 1 where insecticides are not planned for use. Alternative 2 would use the most insecticide over the longest time period as year after year new beetle flights reach susceptable stands which must be treated several times. EDB is volitile and potentially detrimental to wildlife only by direct application. Lindane, although a persistant hydrocarbon, has a low acute toxicity for birds or mammals. The retention of lindane in body tissues is minimal and elimination is rapid so it does not cause serious chronic toxicity problems at the level it is used in Alternative 2. Alternative 3 would use insecticides for direct control for one year, then probably no more would be used. The - rating reflects the short term use, the 0 show no lingering environmental effects in the long term.

Stream Fauna - Management requirements will keep the insecticide from reaching streams and lakes. There is no effect in any alternative.

Vegetation - Background documents for lindane and EDB Show that treatment levels will not cause plant damage. There is no significant change among the alternatives.

Air Quality - Alternative 1 rates a -- because smoke will be generated by wildfires which cannot be timed for conditions when smoke dispersal is good. Both alternatives 2 and 3 will result in controlled burning that can be conducted at times when smoke dispersal is high. Some wildfire will occur under Alternatives 2 and 3.

Water Quality - Water quality ratings were tied to the amount of disturbance expected. Chances of having a fire are much greater under Alternative 1. A fire would likely kill or remove much of the protective vegetation and ground cover. This loss of protection would likely release large amounts of soils and debris during a storm event. In this heavily disected country much of the materials will likely end up in channels and the water sources. Alternative 2 and 3 are expected to have less chance for fire or smaller fires due to better access roads and less fire loads. Alternative 3 will cause more ground disturbance than 2 due to treatment activities but should not produce much change in water quality when constraints are strictly followed. Use of pesticides will be limited by constraints to protect water quality or they will not be used. In addition alternative 3 will favor vigorous natural vegetation that offers the best protection for ground cover and water quality.

Noise - The noise level will increase as control efforts increase. These ratings are relative and with all three alternatives project noise will be intermittent and relatively low. The project area currently has some noise near it's many roads and developments.

Recommend this item be deleted since it is relatively unimportant to alternative selection.

Soil

Inherent Feritility - A significant portion of the area to be treated has an accumulation of pine needles up to 2" in thickness. This material contains nutrients which will be released following burning. The potential for improving soil productivity due to the increased availability of certain material nutrients and the increased nitrogen-fixation leans heavily on a site-specific situation.

For these reasons Alternatives 2 and 3 are rated equally. While both will receive burning as a treatment and there will theoretically be more acreage accomplished on Alternative 3 in a much shorter time frame, the site conditions will ultimately reveal the relative advantage of the other. At this time it seems more logical to rate Alternatives 2 and 3 the same but both of them being better than Alternative 1.

Erosion - Most forest land is quite resistant to erosion until soil disturbance is initiated (barring the concentration of water resulting from mans activities from structures like water bars, culverts, and terrace outlet).

Alternative 1 would normally maintain good cover with essentially no soil disturbance. In the event of wildfire, considerable soil will be exposed with a significant erosion potential. Alternative 2 would have some ground disturbance with little if any fudning for property revegetation measures. Alternative 3 would have the most disturbance, however adequate resource prescriptions would be implemented to establish an effective vegetative cover as a means of minimizing soil erosion.

Reservoir Degradation - Reservoir degradation is primarily concerned with Gross Reservoir and to a lesser extent Barker Reservoir. Degradation will be more severe under Alternative 1 in an area which has a high fire risk. Fire will likely release much soil that will be trapped in the reservoirs. This will tend to fill the reservoirs as well as add increasing turbidity and chemicals in the water. The decrease in reservoir depth and added nutrients may also lead to possible eutrophication.

Alternatives 2 and 3 will tend to favor less fire hazard and have little effect on the reservoirs.

Research Value - Only alternative 3 has a research program proposed, that rates + for a short term effect and ++ for long term effects. Studies on the pilot project can be applied and throughout the Front Range.

Visual Quality - The site of a dead and dying forest is reflected in the poorest rating for environmental quality in Alternative 1. Alternative 2 results in landscapes that have groups of "redtops" and dead stands among the green trees. The aspect is one of a sick forest which rates a minus. The alterantive featuring vegetation management will show a short term negative effect similar to Alternative 2. As the beetle epidemic is controlled and regeneration occurs, the scenery becomes one of a healthy forest, which provides a high visual quality rating of ++.

Insect Control - This section includes the number of acres of direct control and acres of improved stand condition. The data is developed in the budget proposal and shows the greatest number of acres treated in Alternative 3.

BENEFIT/COST ANALYSIS
PILOT PROJECT FOR VEGETATION MANAGEMENT
COLORADO FRONT RANGE

RESULTS

The three alternatives and the respective benefit/cost ratio (BCR), net present worth (NPW) and internal rate of return (IRR) at a 10% interest rate are:

Economic Parameter	Custodial Management	Current Direction	Proposed Project
BCR	.22	1.41	1.89
NPW ($M)	-258.48	304.55	3,098.99
IRR	0.0	28.66	31.23

With the assumptions utilized, the proposed project is the most economically efficient alternative.

Benefit/cost ratios by RPA systems affected in the three alternatives are:

RPA System	Custodial Management	Current Direction	Proposed Project
Recreation	0.68	0.90	2.17
Wildlife	2.94	3.04	5.59
Timber	0.11	0.71	0.25
Land and Water	0	1.50	1.64
Human and Community Development	.25	1.56	6.72

These ratios reflect the change in management direction the region has taken to enhance recreation, wildlife and the scenic beauty of the Front Range.

METHODS

A ten year planning horizon was utilized in this analysis to determine the relative economic worthiness of each alternative. Regional benefit/cost guidelines developed for mountain pine beetle suppression projects were incorporated. [1] These guidelines attempt to show how to minimize potential economic losses that can occur to society through a destructive insect. The methods appear applicable to this project.

The INVEST III program was used to calculate the economic worthiness. Input into the program is shown both by RPA systems and budget line item. Benefits and costs are summarized by RPA system.

Custodial and current management alternatives reflect the decisions made in FY 76 to treat the mountain pine beetle outbreak along the Front Range by the agencies involved. That decision was directed toward maximizing control opportunities within Designated Control Areas (DCA's). The proposed alternative is to bring more land into a managed condition that will meet the public desires for recreation, wildlife and scenic values in FY 1978. A companion objective is to minimize the adverse fuel situation created by the current drought and mountain pine beetle outbreak. Further information on the custodial and current direction alternatives are taken from the benefit/cost sections of the Environment Analysis Reports prepared by the Colorado State Forest Service and Arapaho and Roosevelt National Forests in FY 1976.

COSTS

Cost estimates for the selected alternative are those used in the proposed project (attached). The proposed project contains a $1.00/ac annual maintenance cost that will occur over the life of the project. This cost is expected to be borne by the land managers. Custodial costs are current direction costs less MPB and fuel management funding. Current direction costs were provided by the District Ranger, Forest Service, USDA and District Forester, Colorado State Forest Service, for the proposed project area.

[1] Averill, R. D. et. al. 1977. Guidelines for estimating the benefits of mountain pine beetle control projects. Technical Report R2-11, Review Draft Manuscript, 30 pp.

BENEFITS

The valuation of benefits is difficult when they involve non-monetary goods and services. Overlapping benefits are also difficult to separate from each other. For example, it would appear that a portion of the wildlife system value is applicable to the recreation system. No attempt has been made to more thoroughly separate RPA system benefits and it is assumed that these errors are nearly equally distributed between systems.

A discussion of those benefits which need additional explanation follows:

A. Residential Property

	Acreage	Residential Lots	Acres/Lot
Subdivisions	1,967	836	2.35
Settlements	25 *	83	0.3 *
Parcels	5,730 *	1,146	5.0 *
Totals	7,722	2,065	

* Estimated

Residential Acreage = 7,722 acres (44% private land)
Residential Lots = 2,065

Selling price of a residential lot with trees from data collected during a study, [2] "The Contribution of Trees to Mountain Residential Property Values" ranged from $4,500 to $17,000. However, a range more consistent with the proposed project area would be $10 - $12,500. Current value is near the upper limit due to the limited growth position in Boulder.

[2] Mehaffey, Jr., R. E. 1977. The Contribution of Trees to Mountain Residential Property Values. Colorado State Forest Service.

An estimated 65% of subdivision and settlement lots have trees as do 95% of the parcels. Total estimated number of residential lots with trees is 1,686. Estimated value of these residuential lots at $12,000 is $20,232,000.

A aforementioned study showed that approximately 15-25% of raw land residential lot value is attributable to trees. Twenty percent was used in the Benefit Cost determination for the alternatives of the vegetative management plan. In the INVEST III printout, property value protected is expressed as the difference in dollars saved in the current direction and proposed project alternatives.

B. Fire

The economic impact of fire is a very complex relation between many physical and economic factors. The major physical variables considered in this analysis were microclimate and fuel type. Average weather conditions were used to compare all alternatives. The economic factors were expressed as resource damage per acre and suppression costs per acre. This cost data was taken from the 260 acre Comforter mountain fire which occured in the project area in 1976.

Resource damage was $2,060 per acre and suppression costs was $468.70 per acre. The expected acreage lost per year was calculated using a simple linear probability model for occurance and expected fire behavior models [3] were used to estimate fire behavior. The results are shown below.

	Custodial Management	Current Direction	Proposed Project
Total Acres Expected	32,090	32,090	32,090
Annual Loss (Acres)	385	257	128
Annual Resource Damage ($)	793,846	529,230	264,615
Annual Suppression Costs ($)	180,506	120,337	60,169

[3] Albini, F. A. 1976. Estimating Wildfire Behavior and Effects. USDA, General Technical Report, INT-30, 92 pp.

In the INVEST III printout all damage and suppression costs were expressed in terms of dollars saved as a result of the current management and proposed project alternatives.

C. Wildlife

In the Colorado Front Range Vegetation Management Proposal it was conservatively estimated the deer herd would increase by 5,000. Assuming that 25 percent of these deer can be harvested annually. and that each hunter is in the field 3 days, and has a success ratio of 30 percent; the increased deer population would provide an additional 12,500 hunter days or an increase of 13 percent.

In 1973, Ross, Blood and Nobe [4] surveyed sportsmen expenditures for hunting and fishing in Colorado and found that deer hunters spent $85.13 per hunter day. This increased hunter recreation would generate $1,064,125 annually in the Colorado economy.

Colorado Front Range Vegetation Management Pilot Project - This project area is 34,300 acres which is 9.5 percent of "Big Game Unit 29."

Deer - hunter use in 1975, in Unit 29 was 1,260 days X .095 = 120 deer hunter days in the pilot project area. Assuming the 13 percent increase of the overall project the deer hunter increase would be 16 hunter days or $1,362. The increase would be captured at 20 percent annually to year 5 and remain at 100 percent to year 10.

Elk - increase for the pilot project is assumed to be the same as for deer. With 1,829 elk hunter days X .095 = 174 hunter days which would result in an annual increase of $1,617. This increase would be captured at the same rate as for deer.

Small Game - based on 1974 Colorado Harvest Report for Boulder County and 1973 expenditure data, hunting of blue grouse, rabbit, hare and squirrel would increase by 10 percent and result in an annual benefit of $1,262. This value would be captured at 25 percent for 4 years and at 100 percent to year 10.

Non-Consumptive Wildlife Use - based on the 1970 Boulder population over 18 years of age, and assuming 7.3 percent of the population would participate 38 days per individual (from 1970 National Hunting and Fishing Survey) the recreation use produced would be 245,100 days of

[4] Ross, Blood and Nobe. 1975. Survey of Sportsmen Expenditures for Hunting and Fishing in Colorado. Department of Economics, Colorado State University, Fort Collins, Colorado, 102 pp.

non-consumptive wildlife use. In the pilot project area the use would be 17,157 recreation days at $65.40/day from 1971 Study of Ten Southeastern States. Assuming the increase would be 5 percent there would be an annual increase of $56,103 in the pilot project area.

D. Timber

The wood product industry within the Front Range is poorly developed. Thus, the capability of industry to absorb the volume of wood proposed in this plan is assumed to be limited. Therefore, only stumpage value is assigned as the benefit to be gained. Stumpage for sawtimber is $15.00 MBF; roundwood $1.00 Cunit; Fuelwood $.50 Cord.

The following volumes will be available during the project:

Product	NFS Lands	S&PF Lands
Sawtimber	2.75 MMBF	6.25 MMBF
Roundwood	2,860 Cunits	2,440 Cunits
Fuelwood	11,800 Cords	16,200 Cords

We estimate an "allowable cut effect" will occur on the Forest as a whole which will be recognized in future management activities. This will amount to an estimated annual increase of 531 MBF on NFS lands and 435 MBF on S&P lands. Future demand on the vegetation for a variety of uses will require some type of regular harvest to maintain the health of the forest.

E. Congressional Inquiries (Savings in Administrative Time and Costs)

The outbreak of mountain pine beetle has stimulated a level of public inquiry above what the normal overhead and manpower costs and time are expected to handle. Inquiries over the normal were set at 100 for the custodial alternative, 20 in current direction and 0 in the proposed project. Writing and reviewing each inquiry was set at an average of 1 day for a GS-11/5 at $77.00 per day.

F. Recreation and Aesthetics

Recreation visitor day use was 136,000 in the project area in 1976. A complex interaction between recreation and the other benefits is present. The anticipated recreation benefits were set at $7,000 per year.

Aesthetics were prorated using the 1976 Arapaho and Roosevelt National Forests Mountain Pine Beetle EAR for the current and custodial alternatives. The annual benefit between years 2 and 10 was valued at $24,000. In the proposed project, recreation and aesthetics are 3 percent of the total benefits.

G. Losses Due to Mountain Pine Beetle

In the custodial and current management alternatives, it is assumed that the outbreak will collaspe by year seven throughout the area. The primary difference in losses between the 3 alternatives is due to the increased number of stands being placed under better growing conditions. The proposed alternative would place all ponderosa stands into a better growing condition in one year.

Losses to M.P.B.	Custodial Management	Current Direction	Proposed Project
Fed. Sawtimber/yr	30 MBF	16 MBF	< 1 MBF
Fed. Roundwood loss by year 10	11,862 MBF	5,383 MBF	0
S&P timber/yr	903 MBF	361 MBF	< 1 MBF

NATIONAL FOREST - BOULDER-LONGMONT PROJECT

UNIT - VEGETATION MANAGEMENT

ATTENTION - AVERILL & SONNEN

INVESTMENT ANALYSIS PROGRAM USFS - FAST VERSION

PROBLEM - CUSTODIAL MANAGEMENT

DOLLARS IN THOUSANDS

O.M.B. RATE .1000 | OPT. INT. RATE .0638 | RANKING RATE .1000

		VALUE	YEARS		TOTAL UNITS	FIRST YEAR TOTAL DOLLARS	$ DISCOUNTED AT 10.00 %	
		TYPE	BEGIN	END	PER YEAR	COST OR INCOME	COST	BENEFIT
1	04 030 MPB S.T. LOSS	2	1	7	.00	-.45	-2.41	.00
2	04 030 ROUNDWOOD LOSS (SUM)	1	0	10	.00	-177.93	-75.46	.00
3	04 030 TIMBER COSTS	2	1	10	.00	-.75	-5.07	.00
4	04 030 TIMBER SALES	2	1	10	.00	2.99	.00	18.37
5	01 070 RECREATION	2	1	10	.00	-4.03	-27.24	.00
6	01 070 RECREATION	2	1	10	.00	3.00	.00	18.43
7	02 080 WILDLIFE	2	1	10	.00	-.17	-1.15	.00
8	02 080 WILDLIFE	2	1	10	.00	.55	.00	3.38
9	05 090 SOIL & WATER MGT.	2	1	10	.00	-.01	-.07	.00
10	06 070 AESTHETICS LOST	2	1	10	.00	-11.19	-75.63	.00
11	06 170 CONG. INQUIRIES	2	1	10	.00	-2.75	-18.59	.00
12	06 170 GEN. FOR. LAND MANAGEMEN	2	1	10	.00	-4.99	-33.73	.00
13	06 170 GEN. FOR. LAND MANAGEMEN	2	1	10	.00	5.25	.00	32.26
14	04 404 COOR FOREST MGT.	2	1	10	.00	-13.55	-91.58	.00
						TOTALS =	-330.93	72.44

SUMMARY REPORT
LISTING OF COMBINED ITEMS
DISCOUNTED AT 10.00%
FOR PROBLEM CUSTODIAL MANAGEMENT

SEQ. NO.	COMBINATION NO.	RPA SYSTEM	COST	BENEFIT
	04	TIMBER	-174.52	18.37
	01	OUTDOOR RECREATION AND WILDERNESS	-27.24	18.43
	02	WILDLIFE AND FISH HABITAT	-1.15	3.38
	05	LANDS AND WATER	-.07	.00
	06	HUMAN AND COMMUNITY DEVELOPMENT	-127.95	32.26
		TOTALS=	-330.93	72.44

****
EVALUATION OF PROJECT OR PROGRAM
****

PERCENT USED	BENEFIT COST RATIO	$ NET PRESENT WORTH	$ ANNUAL EQUIVALENT VALUE OF N P W	YEARS PLANNED
O.M.B. RATE 10.00	.2189	-258.48	-42.07	10
STD TEST RATE 3.00	.2148	-367.64	-43.10	10
STD TEST RATE 15.00	.2201	-209.65	-41.77	10
OPT.RATE 6.38	.2171	-307.32	-42.51	10

LOSS

NATIONAL FOREST - VEGETATION MANAGEMENT

PROBLEM - CURRENT DIRECTION

	O.M.B. RATE	OPT. INT. RATE	RANKING RATE
FISCAL YEAR 77	.1000	.0638	.1000

			VALUE	YEARS		TOTAL UNITS	FIRST YEAR TOTAL DOLLARS	$ DISCOUNTED AT 10.00 %	
			TYPE	BEGIN	END	PER YEAR	COST OR INCOME	COST	BENEFIT
1	04	030 MPB S.T. LOSS	2	1	7	.00	-.24	-1.29	.00
2	04	030 ROUNDWOOD LOSS (SUM)	1	0	10	.00	-80.75	-34.25	.00
3	04	030 TIMBER COSTS	2	1	10	.00	-1.85	-12.50	.00
4	04	030 TIMBER SALES	2	1	10	.00	8.94	.00	54.93
5	01	070 RECREATION	2	1	10	.00	-5.03	-34.00	.00
6	01	070 RECREATION	2	1	10	.00	5.00	.00	30.72
7	02	080 WILDLIFE	2	1	10	.00	-.17	-1.15	.00
8	02	080 WILDLIFE	2	1	10	.00	.57	.00	3.50
9	05	090 SOIL & WATER MGT.	2	1	10	.00	-.01	-.07	.00
10	06	070 AESTHETICS LOST	2	1	10	.00	-7.83	-52.92	.00
11	06	170 CONG. INQUIRIES	2	1	10	.00	-.55	-3.72	.00
12	06	170 GEN. FOR. LAND MANAGEMEN	2	1	10	.00	-4.99	-33.73	.00
13	06	170 GEN. FOR. LAND MGT.	2	1	10	.00	5.75	.00	35.33
14	04	404 COOR FOREST MANAGEMENT	2	1	7	.00	-5.42	-29.03	.00
15	06	PROPERTY VALUE PROTECTED	2	1	10	.00	47.50	.00	291.87
16	05	102 F.F. SUPP. COST PREV.	2	1	10	.00	7.35	.00	45.16
17	05	102 F.F. DAMAGE PREVENTED	2	1	10	.00	30.69	.00	188.58
18	05	402 F.F. SUPP. COST PREV.	2	1	10	.00	12.51	.00	76.87
19	05	402 F.F. DAMAGE PREVENTED	2	1	10	.00	52.26	.00	321.12
20	05	115 F.F. FUELS MANAGEMENT	2	1	10	.00	-1.26	-8.52	.00
21	05	120 ROAD MAINTENANCE	2	1	10	.00	-.04	-.27	.00
22	05	413 FIDM & STATE APPROP.(INI	2	1	3	.00	-100.20	-274.10	.00
23	05	413 FIDM & STATE APPROP.(MT.	2	4	10	.00	-4.00	-16.09	.00
24	06	CONTRIBUTED COSTS (INITIAL)	2	1	3	.00	-39.43	-107.86	.00
25	06	CONTRIBUTED COSTS (MAINT.)	2	4	10	.00	-3.00	-12.07	.00
26	05	044 FIDM	2	1	3	.00	-23.10	-63.19	.00
27	05	044 FIDM	1	0	4	.00	-21.00	-15.78	.00
28	05	044 FIDM	1	0	5	.00	-18.90	-12.91	.00
29	05	044 FIDM	1	0	6	.00	-16.80	-10.43	.00
30	05	044 FIDM	1	0	7	.00	-14.70	-8.30	.00
31	05	044 FIDM	1	0	8	.00	-12.60	-6.47	.00
32	05	044 FIDM	1	0	9	.00	-10.50	-4.90	.00
							TOTALS =	-743.53	1048.08

SUMMARY REPORT
LISTING OF COMBINED ITEMS
DISCOUNTED AT 10.00%
FOR PROBLEM CURRENT DIRECTION

SEQ. NO. COMBINATION NO. RPA SYSTEM

04	TIMBER	-77.06	54.93
01	OUTDOOR RECREATION AND WILDERNESS	-34.00	30.72
02	WILDLIFE AND FISH HABITAT	-1.15	3.50
05	LANDS AND WATER	-421.02	631.72
06	HUMAN AND COMMUNITY DEVELOPMENT	-210.30	327.20
	TOTALS=	-743.53	1048.08

COST/BENEFIT ITEM DIFFERENCES FROM SPECIFIED E

NOTE- WHEN EITHER A COST OR BENEFIT ITEM OF THE ALTERNATIVE
IS COMPARED WITH THE BASE AND IS GREATER, THE DIFFERENCE
WILL SHOW AS A POSITIVE VALUE.
WHEN THE DIFFERENCE IS LESS, THE VALUE IS NEGATIVE.

PROBLEM-CURRENT DIRECTION COMPARED TO BASE

SEQ NO.	ITEM	DISCOUNTED AT10.00% COST	BENEFIT
1	04 030 MPB S.T. LOSS	-1.	
2	04 030 ROUNDWOOD LOSS (SUM)	-41.	
3	04 030 TIMBER COSTS	7.	
4	04 030 TIMBER SALES		37.
5	01 070 RECREATION	7.	
6	01 070 RECREATION		12.
8	02 080 WILDLIFE		0.
10	06 070 AESTHETICS LOST	-23.	
11	06 170 CONG. INQUIRIES	-15.	
13	06 170 GEN. FOR. LAND MGT.		3.
14	04 404 COOP FOREST MANAGEME	-63.	
15	06 PROPERTY VALUE PROTEC		292.
16	05 102 F.F. SUPP. COST PREV		45.
17	05 102 F.F. DAMAGE PREVENTE		189.
18	05 402 F.F. SUPP. COST PREV		77.
19	05 402 F.F. DAMAGE PREVENTE		321.
20	05 115 F.F. FUELS MANAGEMEN	9.	
21	05 120 ROAD MAINTENANCE	0.	
22	05 413 FIDM & STATE APPROP.	274.	
23	05 413 FIDM & STATE APPROP.	16.	
24	06 CONTRIBUTED COSTS (INITI	108.	
25	06 CONTRIBUTED COSTS (MAINT	12.	
26	05 044 FIDM	63.	
27	05 044 FIDM	16.	
28	05 044 FIDM	13.	
29	05 044 FIDM	10.	
30	05 044 FIDM	8.	
31	05 044 FIDM	6.	
32	05 044 FIDM	5.	
	DISCOUNTED NET CHANGE FROM BASE=	413.	976.

CHANGE IN NPW $ 563.

****
EVALUATION OF PROJECT OR PROGRAM
****

	PERCENT USED	BENEFIT COST RATIO	$ NET PRESENT WORTH	$ ANNUAL EQUIVALENT VALUE OF N P W	YEARS PLANNED
O.M.B. RATE	10.00	1.4096	304.55	49.56	10
STD TEST RATE	3.00	1.6428	569.30	66.74	10
STD TEST RATE	15.00	1.2734	183.81	36.62	10
OPT.RATE	6.38	1.5235	423.74	58.61	10

INTERNAL RATE OF RETURN IS 28.66 PERCENT
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NATIONAL FOREST - VEGETATION MANAGEMENT

PROBLEM - PROPOSED PROGRAM

DOLLARS IN THOUSANDS	O.M.B. RATE .1000	OPT. INT. RATE .0638	RANKING RATE .1000

			VALUE	YEARS		TOTAL UNITS	FIRST YEAR TOTAL DOLLARS	$ DISCOUNTED AT 10.00 %	
			TYPE	BEGIN	END	PER YEAR	COST OR INCOME	COST	BENEFIT
2	04	030 ROUNDWOOD LOSS (SUM)	1	0	10	.00	-.01	-.00	.00
3	04	030 TIMBER COSTS	1	0	1	.00	-542.65	-542.65	.00
4	04	030 ALLOW. CUT EFFECT	2	5	10	.00	3.72	.00	11.07
5	01	070 RECREATION	1	0	1	.00	-19.84	-19.84	.00
6	01	070 RECREATION	2	1	10	.00	7.00	.00	43.01
7	02	080 WILDLIFE	1	0	1	.00	-65.11	-65.11	.00
9	05	090 SOIL & WATER MGT.	1	0	1	.00	-16.62	-16.62	.00
10	06	070 AESTHETICS IMPROVED	2	2	10	.00	24.00	.00	125.65
14	04	404 COOP FOREST MANAGEMENT	1	0	1	.00	-13.60	-13.60	.00
33	05	102 F.F. SUPP. COST PREV.	2	1	10	.00	44.52	.00	273.56
34	05	102 F.F. DAMAGE PREVENTED	2	1	10	.00	195.81	.00	1203.17
35	05	115 F.F. FUELS MANAGEMENT	1	0	1	.00	-579.31	-579.31	.00
36	06	PROPERTY VALUE PROTECTED	2	1	10	.00	240.00	.00	1474.70
37	05	402 F.F.SUPP. COST PREV.	2	1	10	.00	75.81	.00	465.82
38	05	402 F.F.DAMAGE PREV.	2	1	10	.00	333.41	.00	2048.66
39	05	402 COOP F.F.CONTROL	1	0	1	.00	-785.31	-785.31	.00
40	04	413 GEN.FOR.ASSISTANCE	1	0	1	.00	-100.94	-100.94	.00
41	05	413 FIDM	1	0	1	.00	-404.32	-404.32	.00
42	06	800 NYACC	1	0	1	.00	384.70	.00	349.73
43	06	TITLE 6 CETA	1	0	1	.00	73.19	.00	66.54
44	06	LOCAL AGENCIES	1	0	1	.00	-51.94	-51.94	.00
45	06	PRIVATE CONTRIBUTED	1	0	1	.00	-248.27	-248.27	.00
46	04	030 SAWTIMBER SALES	1	0	1	.00	41.25	.00	37.50
47	04	030 ROUNDWOOD SALES	1	0	1	.00	2.86	.00	2.60
48	04	030 FUELWOOD SALES	1	0	1	.00	5.90	.00	5.36
49	04	404 SAWTIMBER SALES	1	0	1	.00	93.75	.00	85.23
50	04	404ROUNDWOOD SALES	1	0	1	.00	2.44	.00	2.22
51	04	404 FUELWOOD SALES	1	0	1	.00	8.10	.00	7.36
52	04	404 ALLOW. CUT EFFECT	2	5	10	.00	4.54	.00	13.51
53	02	080 DEER USER INCREASE	3	1	5	.00	.27	.00	2.88
54	02	080 DEER USER INCREASE	2	6	10	.00	1.36	.00	3.20
55	02	080 ELK USER INCREASE	3	1	5	.00	.32	.00	3.41
56	02	080 ELK USER INCREASE	2	6	10	.00	1.67	.00	3.93
57	02	080 NON.CON. WILDLIFE INCREA	3	1	4	.00	.32	.00	2.42
58	02	080 NON.CON. WILDLIFE INCREA	2	5	10	.00	1.26	.00	3.75
59	02	080 SMALL GAME USER INCREASE	2	1	10	.00	56.10	.00	344.71
60	05	STATE FUNDING	1	0	1	.00	-250.48	-250.48	.00
61	05	AG. CONS. PROGRAM	1	0	1	.00	-204.98	-204.98	.00
62	05	FUTURE MAINT. COST ALL LANDS	2	2	10	.00	-34.30	-197.53	.00
							TOTALS =	-3480.91	6579.96

SUMMARY REPORT
LISTING OF COMBINED ITEMS
DISCOUNTED AT 10.00%
FOR PROBLEM PROPOSED PROGRAM

SEQ. NO.	COMBINATION NO.	RPA SYSTEM	COST	BENEFIT
	04	TIMBER	-657.19	164.84
	01	OUTDOOR RECREATION AND WILDERNESS	-19.84	43.01
	02	WILDLIFE AND FISH HABITAT	-65.11	364.29
	05	LANDS AND WATER	-2438.55	3991.20
	06	HUMAN AND COMMUNITY DEVELOPMENT	-300.21	2016.61
		TOTALS=	-3480.91	6579.96

COST/BENEFIT ITEM DIFFERENCES FROM SPECIFIED E

NOTE- WHEN EITHER A COST OR BENEFIT ITEM OF THE ALTERNATIVE
IS COMPARED WITH THE BASE AND IS GREATER, THE DIFFERENCE
WILL SHOW AS A POSITIVE VALUE.
WHEN THE DIFFERENCE IS LESS, THE VALUE IS NEGATIVE.

PROBLEM-PROPOSED PROGRAM COMPARED TO BASE

SEQ NO.	ITEM	DISCOUNTED AT 10.00% COST	BENEFIT
1	04 030 MPB S.T. LOS	-2.	
2	04 030 ROUNDWOOD LOSS (SUM)	-75.	
3	04 030 TIMBER COSTS	538.	
4	04 030 ALLOW. CUT EFFECT		-7.
5	01 070 RECREATION	-7.	
6	01 070 RECREATION		25.
7	02 080 WILDLIFE	64.	
8	02 080 WILDLIFE		-3.
9	05 090 SOIL & WATER MGT.	17.	
10	06 070 AESTHETICS IMPROVED		201.
11	06 170 CONG. INQUIR	-19.	
12	06 170 GEN. FOR. LA	-34.	
13	06 170 GEN. FOR. LA		-32.
14	04 404 COOP FOREST MANAGEME	-78.	
33	05 102 F.F. SUPP. COST PREV		274.
34	05 102 F.F. DAMAGE PREVENTE		1203.
35	05 115 F.F. FUELS MANAGEMEN	579.	
36	06 PROPERTY VALUE PROTECTED		1475.
37	05 402 F.F.SUPP. COST PREV.		466.
38	05 402 F.F.DAMAGE PREV.		2049.
39	05 402 COOP F.F.CONTROL	785.	
40	04 413 GEN.FOR.ASSISTANCE	101.	
41	05 413 FIDM	404.	
42	06 800 NYACC		350.
43	06 TITLE 6 CETA		67.

44	06 LOCAL AGENCIES	52.		
45	06 PRIVATE CONTRIBUTED	248.		
46	04 030 SAWTIMBER SALES		38.	
47	04 030 ROUNDWOOD SALES		3.	
48	04 030 FUELWOOD SALES		5.	
49	04 404 SAWTIMBER SALES		85.	
50	04 404ROUNDWOOD SALES		2.	
51	04 404 FUELWOOD SALES		7.	
52	04 404 ALLOW. CUT EFFECT		14.	
53	02 080 DEER USER INCREASE		3.	
54	02 080 DEER USER INCREASE		3.	
55	02 080 ELK USER INCREASE		3.	
56	02 080 ELK USER INCREASE		4.	
57	02 080 NON.CON. WILDLIFE IN		2.	
58	02 080 NON.CON. WILDLIFE IN		4.	
59	02 080 SMALL GAME USER INCR		345.	
60	05 STATE FUNDING	250.		
61	05 AG. CONS. PROGRAM	205.		
62	05FUTURE MAINT. COST ALL LA	198.		
		3226.	6583.	

DISCOUNTED NET CHANGE FROM BASE=

CHANGE IN NPW $ 3358.

****
EVALUATION OF PROJECT OR PROGRAM
****

	PERCENT USED	BENEFIT COST RATIO	$ NET PRESENT WORTH	$ ANNUAL EQUIVALENT VALUE OF N P W	YEARS PLANNED
O.M.B. RATE	10.00	1.8903	3099.05	504.36	10
STD TEST RATE	3.00	2.5267	5420.30	635.43	10
STD TEST RATE	15.00	1.5800	1999.17	398.34	10
OPT.RATE	6.38	2.1830	4155.75	574.84	10

INTERNAL RATE OF RETURN IS 31.23 PERCENT
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PROJECTS RANKED BY THEIR INTERNAL RATE OF RETURN

PROBLEM TITLE	NPW AT 10.00%	IRR	DOLLARS-NONDISCOUNTED COST 1ST YR	2ND YR	3RD YR	4TH YR	5TH YR	ACCUMUL 1ST 5YR COST
PROPOSED PROGRAM	3099.05	31.23	3283.37	34.30	34.30	34.30	34.30	3420.57
CURRENT DIRECTION	304.55	28.66	190.12	190.12	190.12	55.39	53.29	679.04
CUSTODIAL MANAGEMENT	-258.48	.00	37.89	37.89	37.89	37.89	37.89	189.45

PROJECTS RANKED BY THEIR NET PRESENT WORTHS AT 10.00 PERCENT

PROBLEM TITLE	NPW AT 10.00%	IRR	DOLLARS-NONDISCOUNTED COST 1ST YR	2ND YR	3RD YR	4TH YR	5TH YR	ACCUMUL 1ST 5YR COST
PROPOSED PROGRAM	3099.05	31.23	3283.37	34.30	34.30	34.30	34.30	3420.57
CURRENT DIRECTION	304.55	28.66	190.12	190.12	190.12	55.39	53.29	679.04
CUSTODIAL MANAGEMENT	-258.48	.00	37.89	37.89	37.89	37.89	37.89	189.45

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